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Environmental Radiation Data Report 29
January-March 1982

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This quarterly report contains data from the Environmental Radiation Ambient Monitoring System (ERAMS), and similar networks operated by contributing State, Canada, Mexico, and the Pan American Health Organization are reported in (ERD) when available. The ERAMS is comprised of nationwide sampling station that provide air, surface, and drinking water and milk samples from which environmental radiation levels are derived. The radiation analyses performed on these samples include gross alpha and gross beta levels, gamma analyses for fisson products and specific analyses for uranium, plutonium, strontium, iodine, radium, krypton and trituim.

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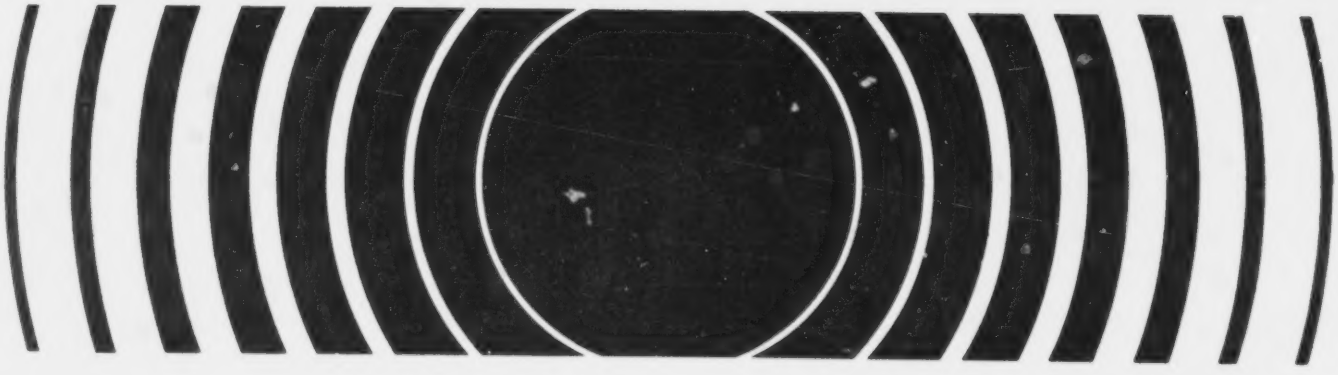

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E N V I R O N M E N T A L

R A D I A T I O N

D A T A

REPORT 29

(January - March 1982)

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

Office of Radiation Programs

Preface

Environmental Radiation Data (ERD) is compiled and distributed quarterly by the Office of Radiation Programs' Eastern Environmental Radiation Facility (EERF), Montgomery, Alabama. Data from the Environmental Radiation Ambient Monitoring System (ERAMS), and similar networks operated by contributing States, Canada, Mexico, and the Pan American Health Organization are reported in (ERD) when available.

ERAMS was established in 1973 by the U. S. Environmental Protection Agency's Office of Radiation Programs (ORP). The ERAMS is comprised of nationwide sampling stations that provide air, surface, and drinking water and milk samples from which environmental radiation levels are derived. The major emphasis for ERAMS is toward identifying trends in the accumulation of long-lived radionuclides in the environment.

1. Sampling locations are selected to provide optimal population coverage while functioning to monitor fallout from nuclear devices and other forms of radioactive contamination of the enviromnent.

2. The radiation analyses performed on these samples include gross alpha and gross beta levels, gamma analyses for fission products and specific analyses for uranium, plutonium, strontium, iodine, radium, krypton and tritium. This monitoring effort also serves to provide ancillary information on releases into the environment from stationary sources such as nuclear power reactors, fuel fabrication and reprocessing plants and natural background levels.

E N V I R O N M E N T A L R A D I A T I O N

D A T A

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DATA - Reporting Rationale and Procedures

The intent of EPA's Office of Radiation Programs in establishing the Environmental Radiation Ambient Monitoring System was to provide continuous, accurate and usable environmental radiation data for the public. Therefore, new data reporting procedures were developed to allow better interpretation of the data. The most significant change in this reporting procedure is that all specific radionuclide analyses will be reported as the counting results indicate, whether the number is negative, zero, or positive.

Reporting Rationale

Frequently, concentrations of a radionuclide in environmental media are close to zero. When the actual concentration of a nuclide is zero, the net counting results should statistically show a distribution of negative and positive numbers about zero. This occurs when the background count is subtracted from a sample which has only background activity. Prior to July 1975, ERAMS data were not reported numerically when the results were less than a specified reporting level or minimum detectable level. The present reporting procedure allows all the data to be reported and evaluated statistically without an arbitrary cutoff of small or negative numbers. This approach will facilitate estimates of bias in the nuclide analyses and will allow better evaluation of distributions and trends in environmental data.

When reviewing the data in this report, caution should be exercised in the interpretation of individual negative values. Obviously, a negative activity value does not have physical significance. Such numbers, however, are significant when taken together with other observations which indicate that the true value of a distribution is near zero. When an average of several measurements produces a result less than zero, this indicates a negative bias in the measurement procedure.

(1) Reported Values

Specific Analyses - All specific radionuclide analyses will be reported as the counting results indicate, whether the number is negative, zero, or positive. Numerical values given are as of sample collection date.

Gross Analyses - The actual value of gross radioactivity measurements will be reported, unless the value is below the minimum detectable level (MDL) at the 2 sigma confidence level, then < minimum detectable level will be reported.

MDL is defined as the 3 sigma error of the background. A tabulation of MDL's is given in the following table.

(2) Reported Error Terms

Each reported value for specific analyses will be accompanied by a counting error term at the 2 sigma (95%) confidence interval. Potassium concentrations are determined by specific activity analyses. Error terms are therefore reported as counting errors. At the very low levels characteristic of most ERAMS measurements, counting error is the greatest contributor to overall error.

(3) Significant Figures

All reported values will be rounded to no more than three significant figures. The last significant figure will be increased by one if the figure following is five or greater, otherwise it is left unchanged.

(4) Reporting Levels

The reporting units, smallest increments for reporting, and minimum detectable levels for each isotope are shown in table 1. Smallest increments are sometimes considerably smaller than minimum detectable amounts to avoid truncation errors in averaging.

(5) Averages

Averages will be calculated along with appropriate error terms in an annual summary and analysis of ERAMS data. In calculating these averages, all values of individual data including negative numbers will be utilized. Averages will not be included in ERD quarterly reports.

TABLE 1

ERAMS Reporting Increments and Minimum Detectable Levels

for Radionuclide Analyses

Radionuclide	Media	Reporting Units	Reporting Increments	Minimum Detectable Levels
Gross alpha	Water	pCi/l	1 pCi/l	2 pCi/l
Gross beta	Air	pCi/m^3	.01 pCi/m^3	.01 pCi/m^3
	Water	pCi/l	1 pCi/l	1 pCi/l
	Precipitation	nCi/m^2	.01 nCi/m^2	.01 nCi/m^2(a)
Tritium	Water	nCi/l	.1 nCi/l	.2 nCi/l
	Milk	nCi/l	.1 nCi/l	.2 nCi/l
Carbon-14	Milk	pCi/l	1 pCi/l	15 pCi/l
Krypton-85	Ambient Air	pCi/m^3	.1 pCi/m^3	2 pCi/m^3
Plutonium-238, 239	Air	aCi/m^3	.1 aCi/m^3	.015 pCi(b) per sample
	Milk	pCi/l	.001 pCi/l	.015 pCi per sample
	Water	pCi/l	.001 pCi/l	.015 pCi per sample
Uranium-234, 235,238	Air	aCi/m^3	.1 aCi/m^3	.015 pCi(b) per sample
	Milk	pCi/l	.001 pCi/l	.015 pCi per sample
	Water	pCi/l	.001 pCi/l	.015 pCi per sample
Radium-226	Water	pCi/l	.1 pCi/l	.1 pCi/l
Strontium-90	Milk	pCi/l	.1 pCi/l	1 pCi/l
	Water	pCi/l	.1 pCi/l	1 pCi/l

Radionuclide	Media	Reporting Units	Reporting Increments	Minimum Detectable Levels
Strontium-89	Milk	pCi/l	1 pCi/l	5 pCi/l[c]
Iodine-131	Milk	pCi/l	1 pCi/l	10 pCi/l[c]
	Water	pCi/l	1 pCi/l	10 pCi/l[c]
	Water (specific radiochemical analysis)	pCi/l	.1 pCi/l	.4 pCi/l
Iodine-129	Milk	fCi/l	.1 fCi/l	.4 fCi/l
Iodine-127	Milk	g/l	10 g/l	10 g/l
Cesium-137	Milk	pCi/l	1 pCi/l	10 pCi/l
	Water	pCi/l	1 pCi/l	10 pCi/l
Barium-140	Milk	pCi/l	1 pCi/l	10 pCi/l[c]
	Water	pCi/l	1 pCi/l	10 pCi/l[c]
Potassium	Milk	g/l	.1 g/l	.12 g/l
	Water	g/l	.1 g/l	.12 g/l
Potassium-40	Water	pCi/l	1 pCi/l	100 pCi/l

(a) The value in terms of nCi/m^2 would be dependent on precipitation (mm).
(b) This value in terms of pCi/m^3 would be dependent on the air volume.
(c) Activity as of the day of counting.

ENVIRONMENTAL RADIATION AMBIENT MONITORING SYSTEM (ERAMS)

SECTION I. Air Program

Airborne Particulates and Precipitation

Gross beta radioactivity measurements and certain specific analyses are performed on air particulates and precipitation samples as indicator measurements in assessing the general (national) impact of all contributing sources on environmental levels of radiation.

Airborne particulates are collected continuously at field stations representing wide geographic coverage, including present and potential sources of environmental radioactivity. Sampling sites are located throughout the United States, Virgin Islands, and the Panama Canal.

Filters (10-cm diameter synthetic fiber) from air samplers are changed twice weekly and field measurements are made with a G-M survey meter at 5 hours and 29 hours after collection to allow for radon and thoron daughter product decay. Field estimates are reported to appropriate EPA officials by telephone or mail depending on the activity levels found.

The filters are sent to EERF for more sensitive analyses in a low background beta counter. Gamma scans are performed on all filters showing laboratory gross beta counts greater than 1 pCi/m^3. The lower gross beta values reported for laboratory measurements are largely due to the decay of radionuclides which occurred between the times of the field estimates and laboratory measurements.

Precipitation samples are collected at the field stations where air filters are collected. These samples are also sent to EERF where they are composited monthly for tritium, gross beta activity measurements and gamma scans.

These locations also correspond to airborne particulate and drinking water sampling locations selected for plutonium analyses. Plutonium-238, -239, and uranium-234, -235, and -238 analyses are performed annually on precipitation samples collected during March - May.

Tables 2 - 4 present the monthly average gross beta concentrations in airborne particulates for January - March 1982.

Tables 5 - 7 present the monthly average gross beta concentration and any specific gamma concentrations for precipitation samples for January - March 1982 A compilation of individual measurements is available from the EPA, EERF, Montgomery, AL 36193.

The tritium in precipitation samples for January - March 1982 at the selected stations are shown in Table 8.

TABLE 2

AIRBORNE PARTICULATES
GROSS BETA CONCENTRATION
JANUARY 1982

LOCATION	# SAM	AIRBORNE PARTICULATES 5-HR FIELD ESTIMATE MAX	MIN	AVG	EERF LAB MEASUREMENT MAX	MIN	AVG
		(pCi/m^3)			(pCi/m^3)		
AL:MONTGOMERY	8	0.4	0.1	0.2	0.02	0.01	0.01
CA:LOS ANGELES	8	1.4	0.2	0.5	0.02	0.01	0.01
CT:HARTFORD	8	0.2	0.0	0.1	0.02	0.01	0.01
FL:JACKSONVILLE	6	0.3	0.1	0.2	0.02	0.01	0.02
FL:MIAMI	7	0.1	0.0	0.1	0.02	0.00	0.01
ID:BOISE	8	0.1	0.0	0.1	0.03	0.01	0.01
ID:IDAHO FALLS	8	NM	NM	NM	0.04	0.01	0.01
IL:CHICAGO	7	0.1	0.0	0.1	0.03	0.02	0.02
KS:TOPEKA	8	0.4	0.1	0.2	0.03	0.01	0.02
ME:AUGUSTA	8	0.1	0.0	0.1	0.02	0.01	0.02
MI:LANSING	8	0.1	0.1	0.1	0.04	0.03	0.04
MN:MINNEAPOLIS	9	0.1	0.0	0.1	0.04	0.02	0.03
MO:JEFFERSON CITY	9	0.3	0.1	0.1	0.04	0.02	0.03
MS:JACKSON	7	0.2	0.1	0.1	0.03	0.01	0.02
NC:CHARLOTTE	3	0.3	0.2	0.2	0.02	0.01	0.02
ND:BISMARCK	8	1.0	0.1	0.2	0.04	0.02	0.03
NJ:TRENTON	6	0.4	0.0	0.1	0.02	0.01	0.01
NM:SANTA FE	1	0.4	0.2	0.2	0.01	0.01	0.01
NV:LAS VEGAS	8	1.3	0.2	0.8	0.03	0.01	0.02
NY:ALBANY	7	0.1	0.0	0.0	0.03	0.02	0.02
NY:NEW YORK CITY	8	0.1	0.1	0.1	0.03	0.02	0.02
NY:NIAGARA FALLS	8	0.1	0.0	0.0	0.02	0.00	0.01
NY:SYRACUSE	8	NM	NM	NM	0.02	0.01	0.02
NY:YAPHANK	5	NM	NM	NM	0.02	0.02	0.02
OH:COLUMBUS	9	0.1	0.1	0.1	0.04	0.01	0.02
OH:PAINESVILLE	8	0.1	0.0	0.1	0.03	0.01	0.02
OH:TOLEDO	8	0.1	0.0	0.1	0.03	0.02	0.02
OR:PORTLAND	7	NM	NM	NM	0.02	0.00	0.01
PA:HARRISBURG	11	0.3	0.0	0.1	0.03	0.01	0.02
PA:PITTSBURGH	8	0.1	0.0	0.0	0.03	0.01	0.02
RI:PROVIDENCE	8	0.2	0.0	0.1	0.02	0.01	0.02
SC:BARNWELL	1	0.1	0.0	0.0	0.01	0.01	0.01
SC:COLUMBIA	8	0.9	0.1	0.3	0.04	0.01	0.02
SD:PIERRE	1	0.7	0.5	0.5	0.04	0.01	0.04
TX:EL PASO	1	0.7	0.2	0.7	0.01	0.01	0.01
VA:LYNCHBURG	8	0.3	0.0	0.1	0.03	0.01	0.02
WA:SEATTLE	8	0.1	0.0	0.1	0.02	0.00	0.00
WA:SPOKANE	8	0.1	0.0	0.1	0.02	0.01	0.01
WI:MADISON	7	0.1	0.0	0.0	0.03	0.02	0.02
WV:CHARLESTON	5	0.3	0.1	0.2	0.02	0.00	0.01

MINIMUM DETECTABLE LIMIT FOR FIELD ESTIMATES - .1 pCi/m^3
MINIMUM DETECTABLE LIMIT FOR LAB MEASUREMENT - .01 pCi/m^3

NM NO MEASUREMENT

TABLE 3

AIRBORNE PARTICULATES
GROSS BETA CONCENTRATION
FEBRUARY 1982

LOCATION	# SAM	AIRBORNE PARTICULATES 5-HR FIELD ESTIMATE MAX (pCi/m^3)	MIN	AVG	EERF LAB MEASUREMENT MAX (pCi/m^3)	MIN	AVG
AL:MONTGOMERY	7	0.4	0.2	0.2	0.02	0.01	0.01
CA:LOS ANGELES	7	0.8	0.2	0.5	0.02	0.01	0.02
CT:HARTFORD	7	0.1	0.1	0.1	0.03	0.01	0.02
FL:JACKSONVILLE	8	0.2	0.0	0.1	0.02	0.01	0.01
FL:MIAMI	8	0.1	0.0	0.0	0.02	0.00	0.01
ID:BOISE	7	0.2	0.0	0.1	0.03	0.01	0.02
ID:IDAHO FALLS	8	NM	NM	NM	0.03	0.01	0.02
IL:CHICAGO	6	0.1	0.0	0.1	0.02	0.01	0.02
KS:TOPEKA	7	0.2	0.1	0.1	0.02	0.01	0.01
ME:AUGUSTA	6	0.1	0.0	0.1	0.02	0.02	0.02
MI:LANSING	6	0.1	0.0	0.1	0.05	0.02	0.03
MN:MINNEAPOLIS	6	0.1	0.0	0.1	0.03	0.01	0.02
MO:JEFFERSON CITY	8	0.2	0.0	0.1	0.03	0.01	0.02
MS:JACKSON	6	0.2	0.1	0.1	0.03	0.01	0.02
ND:BISMARCK	7	0.1	0.0	0.1	0.04	0.01	0.02
NJ:TRENTON	7	0.1	0.0	0.1	0.02	0.01	0.01
NV:LAS VEGAS	6	1.6	0.3	0.8	0.02	0.01	0.02
NY:ALBANY	6	0.4	0.0	0.1	0.03	0.02	0.02
NY:NEW YORK CITY	7	0.1	0.1	0.1	0.03	0.01	0.02
NY:NIAGARA FALLS	6	0.1	0.0	0.0	0.02	0.01	0.02
NY:SYRACUSE	8	NM	NM	NM	0.03	0.01	0.02
OH:COLUMBUS	5	0.1	0.0	0.1	0.03	0.01	0.02
OH:PAINESVILLE	6	0.1	0.0	0.1	0.03	0.01	0.02
OH:TOLEDO	7	0.1	0.0	0.1	0.03	0.01	0.02
OR:PORTLAND	8	NM	NM	NM	0.03	0.00	0.01
PA:HARRISBURG	11	0.2	0.0	0.1	0.03	0.01	0.02
PA:PITTSBURGH	8	0.1	0.1	0.1	0.02	0.01	0.02
RI:PROVIDENCE	6	0.2	0.0	0.1	0.03	0.01	0.02
SC:BARNWELL	1	0.1	0.1	0.1	0.02	0.00	0.00
SC:COLUMBIA	6	0.6	0.1	0.3	0.03	0.01	0.02
SD:PIERRE	9	0.9	0.1	0.3	0.06	0.01	0.04
TX:EL PASO	5	1.4	0.6	1.0	0.03	0.01	0.02
VA:LYNCHBURG	7	0.4	0.0	0.1	0.03	0.01	0.02
WA:SEATTLE	6	0.1	0.0	0.1	0.01	0.00	0.00
WA:SPOKANE	8	0.1	0.1	0.1	0.04	0.00	0.02
WI:MADISON	7	0.1	0.0	0.0	0.03	0.01	0.02
WV:CHARLESTON	5	0.2	0.0	0.1	0.02	0.01	0.01

MINIMUM DETECTABLE LIMIT FOR FIELD ESTIMATES - .1 pCi/m^3
MINIMUM DETECTABLE LIMIT FOR LAB MEASUREMENT - .01 pCi/m^3

NM NO MEASUREMENT

TABLE 4

AIRBORNE PARTICULATES
GROSS BETA CONCENTRATION
MARCH 1982

LOCATION	# SAM	AIRBORNE PARTICULATES 5-HR FIELD ESTIMATE MAX (pCi/m^3)	MIN	AVG	EERF LAB MEASUREMENT MAX (pCi/m^3)	MIN	AVG
AL:MONTGOMERY	9	0.7	0.1	0.4	0.01	0.01	0.01
CA:LOS ANGELES	8	1.0	0.0	0.5	0.02	0.01	0.02
CT:HARTFORD	9	0.2	0.1	0.1	0.02	0.01	0.01
FL:JACKSONVILLE	6	0.2	0.0	0.1	0.02	0.01	0.01
FL:MIAMI	8	0.1	0.0	0.0	0.01	0.01	0.01
HI:HONOLULU	5	0.1	0.0	0.1	0.01	0.00	0.01
IA:IOWA CITY	5	0.2	0.0	0.1	0.02	0.01	0.02
ID:BOISE	9	0.4	0.1	0.2	0.02	0.01	0.01
ID:IDAHO FALLS	9	NM	NM	NM	0.04	0.01	0.02
IL:CHICAGO	9	0.3	0.1	0.1	0.02	0.01	0.02
KS:TOPEKA	9	0.6	0.1	0.4	0.02	0.00	0.01
ME:AUGUSTA	9	0.2	0.0	0.1	0.03	0.01	0.01
MI:LANSING	9	0.2	0.0	0.1	0.04	0.01	0.03
MN:MINNEAPOLIS	9	0.2	0.0	0.1	0.03	0.01	0.02
MO:JEFFERSON CITY	8	0.5	0.1	0.3	0.04	0.01	0.02
MS:JACKSON	9	0.2	0.1	0.2	0.02	0.01	0.01
ND:BISMARCK	9	0.2	0.0	0.1	0.03	0.01	0.02
NJ:TRENTON	9	0.6	0.1	0.2	0.02	0.01	0.01
NV:LAS VEGAS	9	1.3	0.2	0.6	0.02	0.01	0.01
NY:ALBANY	9	0.1	0.0	0.0	0.02	0.01	0.02
NY:NEW YORK CITY	8	0.1	0.1	0.1	0.02	0.01	0.02
NY:NIAGARA FALLS	6	0.1	0.0	0.1	0.02	0.01	0.02
NY:SYRACUSE	9	0.1	0.0	0.0	0.02	0.01	0.02
OH:COLUMBUS	9	0.5	0.0	0.2	0.03	0.01	0.02
OH:PAINESVILLE	9	0.1	0.1	0.1	0.02	0.01	0.02
OH:TOLEDO	9	0.3	0.1	0.1	0.03	0.01	0.02
OR:PORTLAND	9	NM	NM	NM	0.02	0.00	0.01
PA:HARRISBURG	13	1.0	0.1	0.3	0.03	0.01	0.02
PA:PITTSBURGH	8	0.2	0.1	0.1	0.02	0.01	0.01
RI:PROVIDENCE	9	0.8	0.1	0.2	0.02	0.01	0.02
SC:BARNWELL	1	0.6	0.1	0.1	0.03	0.01	0.01
SC:COLUMBIA	8	0.8	0.2	0.5	0.04	0.01	0.02
SD:PIERRE	9	0.7	0.1	0.4	0.03	0.01	0.02
TX:AUSTIN	9	1.9	0.5	1.1	0.04	0.01	0.02
TX:EL PASO	9	1.6	0.6	0.9	0.03	0.02	0.02
VA:LYNCHBURG	8	0.6	0.0	0.2	0.03	0.01	0.01
WA:SEATTLE	9	0.1	0.0	0.1	0.01	0.00	0.01
WA:SPOKANE	9	0.3	0.1	0.2	0.02	0.01	0.01
WI:MADISON	9	0.1	0.0	0.1	0.02	0.01	0.01
WV:CHARLESTON	9	1.0	0.1	0.4	0.02	0.01	0.01
WY:CHEYENNE	1	2.3	0.1	2.3	0.01	0.00	0.00

MINIMUM DETECTABLE LIMIT FOR FIELD ESTIMATES - .1 pCi/m^3
MINIMUM DETECTABLE LIMIT FOR LAB MEASUREMENT - .01 pCi/m^3

NM NO MEASUREMENT

TABLE 5

GROSS BETA CONCENTRATION IN PRECIPITATION

JANUARY 1982

LOCATION	DEPTH	ACT. ± 2s		SPECIFIC GAMMA ACT.
	(mm)	(nCi/m^2)		(pCi/l)
AL:MONTGOMERY	118.3	0.16	0.06	ND
CA:BERKELEY	46.5	0.01	0.02	ND
CA:LOS ANGELES	30.0	0.05	0.02	ND
CT:HARTFORD	43.9	0.09	0.03	ND
FL:JACKSONVILLE	28.3	0.04	0.01	ND
ID:BOISE	51.7	0.08	0.03	ND
ID:IDAHO FALLS	19.8	0.13	0.02	ND
IL:CHICAGO	11.0	0.01	0.01	ND
MI:LANSING	28.1	0.05	0.02	ND
MT:HELENA	2.4	0.02	0.00	ND
ND:BISMARCK	30.5	0.05	0.02	ND
NJ:TRENTON	76.0	0.07	0.03	ND
NY:NEW YORK CITY	13.5	0.00	0.01	ND
OH:PAINESVILLE	20.3	0.06	0.01	ND
OR:PORTLAND	184.4	0.39	0.10	ND
PA:HARRISBURG	41.3	0.05	0.02	ND
SC:BARNWELL	87.5	0.15	0.05	ND
SC:COLUMBIA	147.5	0.21	0.07	ND
VA:LYNCHBURG	78.8	0.31	0.05	ND
WV:CHARLESTON	27.5	0.02	0.01	ND

ND NO GAMMA ACTIVITY DETECTABLE
s SIGMA COUNTING ERROR

TABLE 6

GROSS BETA CONCENTRATION IN PRECIPITATION

FEBRUARY 1982

LOCATION	DEPTH (mm)	ACT. ± 2s (nCi/m^2)		SPECIFIC GAMMA ACT. (pCi/l)
AL:MONTGOMERY	226.6	0.33	0.13	ND
CA:BERKELEY	17.6	0.01	0.01	ND
CT:HARTFORD	36.5	0.08	0.02	ND
FL:JACKSONVILLE	45.4	0.09	0.03	ND
ID:BOISE	42.3	0.13	0.03	ND
ID:IDAHO FALLS	3.7	0.04	0.00	ND
IL:CHICAGO	3.3	0.00	0.00	ND
MI:LANSING	4.4	0.09	0.01	ND
MS:JACKSON	9.3	0.01	0.00	ND
ND:BISMARCK	19.6	0.05	0.01	ND
NJ:TRENTON	39.0	0.11	0.02	ND
NV:LAS VEGAS	10.0	0.25	0.02	ND
NY:NEW YORK CITY	10.6	0.01	0.01	ND
OH:PAINESVILLE	74.5	0.31	0.05	ND
OR:PORTLAND	181.8	0.14	0.08	ND
PA:HARRISBURG	47.0	0.15	0.03	ND
SC:BARNWELL	25.0	0.04	0.01	ND
SC:COLUMBIA	142.5	0.24	0.08	ND
VA:LYNCHBURG	68.9	0.07	0.03	ND
WV:CHARLESTON	50.0	0.14	0.03	ND

ND NO GAMMA ACTIVITY DETECTABLE
s SIGMA COUNTING ERROR

TABLE 7

GROSS BETA CONCENTRATION IN PRECIPITATION

MARCH 1982

LOCATION	DEPTH (mm)	ACT. ± 2s (nCi/m^2)		SPECIFIC GAMMA ACT. (pCi/l)
AL:MONTGOMERY	63.0	0.15	0.04	ND
CA:BERKELEY	26.3	0.04	0.01	ND
CA:LOS ANGELES	22.5	0.03	0.01	ND
CT:HARTFORD	20.7	0.11	0.02	ND
FL:JACKSONVILLE	63.4	0.14	0.04	ND
ID:BOISE	35.6	0.06	0.02	ND
IL:CHICAGO	43.1	0.09	0.02	ND
MI:LANSING	38.4	0.09	0.02	ND
MS:JACKSON	13.5	0.05	0.01	ND
ND:BISMARCK	59.0	0.16	0.04	ND
NJ:TRENTON	24.5	0.12	0.02	ND
NY:NEW YORK CITY	5.0	0.10	0.01	ND
NY:NIAGARA FALLS	5.1	0.11	0.01	ND
OH:PAINESVILLE	49.6	0.16	0.03	ND
OR:PORTLAND	56.2	0.13	0.03	ND
PA:HARRISBURG	39.6	0.14	0.03	ND
SC:COLUMBIA	68.7	0.29	0.05	ND
VA:LYNCHBURG	49.3	0.05	0.02	ND
WV:CHARLESTON	39.1	0.04	0.02	ND

ND NO GAMMA ACTIVITY DETECTABLE
s SIGMA COUNTING ERROR

TABLE 8

PRECIPITATION
TRITIUM CONCENTRATION

JANUARY - MARCH 1982

LOCATION	JANUARY nCi/l ± 2s	FEBRUARY nCi/l ± 2s	MARCH nCi/l ± 2s
AL:MONTGOMERY	0.3 0.2	0.4 0.2	0.3 0.2
CA:BERKELEY	0.2 0.2	0.3 0.2	0.2 0.2
CA:LOS ANGELES	0.2 0.2	NS	0.2 0.2
CT:HARTFORD	0.3 0.2	0.3 0.2	0.2 0.2
FL:JACKSONVILLE	0.3 0.2	0.3 0.2	0.4 0.2
ID:BOISE	0.3 0.2	0.3 0.2	0.4 0.2
ID:IDAHO FALLS	0.2 0.2	0.4 0.2	NS
IL:CHICAGO	0.3 0.2	0.9 0.2	0.3 0.2
MI:LANSING	0.2 0.2	0.4 0.2	0.2 0.2
MS:JACKSON	NS	0.2 0.2	0.2 0.2
MT:HELENA	0.3 0.2	NS	NS
ND:BISMARCK	0.3 0.2	0.3 0.2	0.3 0.2
NJ:TRENTON	0.2 0.2	0.2 0.2	0.2 0.2
NV:LAS VEGAS	NS	0.2 0.2	NS
NY:NEW YORK CITY	0.2 0.2	0.2 0.2	0.2 0.2
NY:NIAGARA FALLS	NS	NS	0.3 0.2
OH:PAINESVILLE	0.2 0.2	0.4 0.2	0.2 0.2
OR:PORTLAND	0.2 0.2	0.2 0.2	0.2 0.2
PA:HARRISBURG	0.2 0.2	0.3 0.2	0.3 0.2
SC:BARNWELL	0.8 0.2	1.1 0.2	NS
SC:COLUMBIA	0.9 0.2	0.6 0.2	0.6 0.2
VA:LYNCHBURG	0.4 0.2	0.3 0.2	0.4 0.2
WV:CHARLESTON	0.2 0.2	0.2 0.2	0.3 0.2

NS NO SAMPLE
s SIGMA COUNTING ERROR

Plutonium and Uranium in Airborne Particulates

Environmental radiation levels of plutonium and uranium are determined by the analyses of quarterly composite samples (air filters) collected from the continuously operating airborne particulate samplers. The number of continuously operating stations is being increased from the original 22 will eventually number 67 when all equipment is operational.

Analyses of the composited filters consist of ashing, separating by liquid ion exchange, and coprecipitation of the plutonium or uranium.

Concentration of the specific isotopes of plutonium-238, -239, and uranium-234, -235, and -238 are determined by alpha spectroscopy. The volume of air analyzed normally ranges from 25,000 to 40,000 m^3 for each quarterly composite.

Plutonium and uranium in airborne particulates data for October - December 1981 are shown for the 42 stations operating during this period in Table 9.

The plutonium and uranium analyses in precipitation for 1981 are shown in Table 10.

TABLE 9

PLUTONIUM AND URANIUM IN AIRBORNE PARTICULATES
OCTOBER - DECEMBER 1981 COMPOSITES

LOCATION	^{238}Pu aCi/m^3 ± 2s		^{239}Pu aCi/m^3 ± 2s		^{234}U aCi/m^3 ± 2s		^{235}U aCi/m^3 ± 2s		^{238}U aCi/m^3 ± 2s	
AL:MONTGOMERY	0.0	0.3	2.1	0.6	10.5	1.7	0.5	0.3	8.9	1.5
CA:LOS ANGELES	6.5	1.5	2.9	0.8	31.2	5.6	3.9	1.3	30.1	5.5
CT:HARTFORD	0.7	0.8	1.6	0.8	16.1	3.2	1.2	0.7	12.0	2.6
FL:JACKSONVILLE	-0.1	0.9	3.4	1.1	23.3	3.6	1.4	0.7	20.2	3.2
FL:MIAMI	0.8	1.1	3.0	1.5	48.9	7.7	1.8	1.2	38.2	6.4
ID:BOISE	1.3	0.7	4.0	1.4	19.5	4.5	2.9	1.3	18.6	4.3
ID:IDAHO FALLS	0.6	0.5	2.7	0.9	26.0	4.3	2.9	0.9	25.1	4.2
IL:CHICAGO	2.5	1.8	4.3	2.1	36.1	7.6	1.7	1.3	33.2	7.2
IN:INDIANAPOLIS	1.4	1.7	4.3	2.1	43.8	8.3	2.1	1.7	37.9	7.4
KS:TOPEKA	0.0	0.5	1.7	0.6	14.4	2.7	0.7	0.5	15.4	2.9
ME:AUGUSTA	0.9	0.5	1.8	0.6	21.5	3.4	0.6	0.5	18.7	3.1
MI:LANSING	0.2	0.4	1.6	0.7	20.1	3.3	0.7	0.5	22.1	3.6
MN:MINNEAPOLIS	1.6	1.0	2.5	1.1	31.6	4.3	1.2	0.7	24.7	3.5
MO:JEFFERSON CITY	0.5	0.8	3.0	1.1	18.9	3.3	0.9	0.6	16.2	3.0
MS:JACKSON	0.9	0.6	3.6	1.0	16.6	2.4	1.2	0.5	17.1	2.4
ND:BISMARCK	2.6	1.4	2.5	1.1	36.4	6.5	1.6	1.0	25.1	5.0
NJ:TRENTON	1.5	1.0	2.6	1.1	25.1	5.7	0.6	0.9	20.5	5.0
NM:SANTA FE	0.2	0.7	4.6	1.5	44.0	6.6	2.0	1.0	43.7	6.6
NV:LAS VEGAS	1.3	1.9	5.7	2.4	106.7	18.5	8.4	2.8	72.3	13.2
NY:ALBANY	0.9	0.6	1.8	0.7	20.0	3.3	1.4	0.7	22.6	3.6
NY:NEW YORK CITY	0.4	0.6	1.5	0.7	19.5	2.9	1.8	0.7	14.8	2.4
NY:NIAGARA FALLS	1.0	0.9	1.6	0.8	39.3	6.6	1.2	0.8	36.9	6.2
NY:YAPHANK	0.2	0.3	1.7	0.5	6.7	1.7	0.2	0.5	5.6	1.6
OH:COLUMBUS	1.2	0.6	2.0	0.7	34.9	4.9	1.2	0.6	38.4	5.3
OH:PAINESVILLE	0.4	0.5	2.4	1.0	25.2	3.5	1.4	0.6	25.8	3.6
OH:TOLEDO	1.4	0.8	1.5	0.8	29.3	4.1	1.0	0.5	27.9	3.9
OK:OKLAHOMA CITY	1.3	1.3	4.6	2.1	30.0	7.8	2.5	2.4	36.3	8.0
OR:PORTLAND	0.7	0.8	1.2	0.8	21.5	4.5	0.2	0.8	22.1	4.6
PA:HARRISBURG	0.3	0.5	2.0	0.8	23.3	3.8	1.6	0.7	14.5	2.7
PA:PITTSBURGH	-0.3	1.0	3.4	1.3	35.6	5.7	3.8	1.4	37.6	5.9
RI:PROVIDENCE	0.7	0.9	2.1	1.0	12.0	2.5	1.5	0.7	10.9	2.4
SC:BARNWELL	1.6	0.8	3.3	1.1	11.0	2.1	0.8	0.4	10.3	2.0
SC:COLUMBIA	0.7	0.6	3.8	1.1	38.4	5.2	1.4	0.6	28.0	4.0
TX:EL PASO	0.9	3.4	4.4	2.7	110.2	16.9	5.0	2.7	95.9	14.9
VA:LYNCHBURG	-0.1	0.2	3.4	0.7	223.9	26.2	8.4	1.6	16.8	2.5
WA:SEATTLE	0.1	0.6	1.6	0.8	13.5	2.6	0.4	0.4	8.9	1.9
WA:SPOKANE	1.2	1.1	1.8	1.1	16.9	2.8	1.9	0.8	12.7	2.3
WI:MADISON	-0.1	0.6	2.0	0.8	21.9	3.3	1.3	0.6	18.6	2.8
WV:CHARLESTON	0.8	0.6	3.6	1.1	37.4	5.3	2.2	0.8	32.6	4.8

THE ^{238}Pu AND ^{239}Pu CONCENTRATIONS REPORTED IN THIS TABLE HAVE BEEN ROUNDED.

s SIGMA COUNTING ERROR

TABLE 10

PLUTONIUM AND URANIUM ANALYSES
OF
SELECTED PRECIPITATION COMPOSITE SAMPLES

1981

LOCATION	^{238}Pu pCi/l ± 2s		^{239}Pu pCi/l ± 2s		^{234}U pCi/l ± 2s		^{235}U pCi/l ± 2s		^{238}U pCi/l ± 2s	
AL:MONTGOMERY	0.002	0.009	0.002	0.004	0.044	0.015	0.005	0.006	0.015	0.008
CO:DENVER	-.001	0.010	-0.007	0.007	0.026	0.011	0.002	0.002	0.011	0.006
CT:HARTFORD	0.012	0.015	0.000	0.005	0.025	0.018	0.005	0.006	0.014	0.010
FL:JACKSONVILLE	0.000	0.008	-0.003	0.004	0.024	0.013	0.002	0.003	0.008	0.008
FL:MIAMI	0.002	0.009	0.004	0.004	0.032	0.012	0.005	0.004	0.015	0.008
ID:BOISE	-.005	0.010	0.004	0.005	0.018	0.009	0.002	0.003	0.008	0.006
ID:IDAHO FALLS	-.007	0.022	0.007	0.010	0.047	0.019	0.004	0.007	0.029	0.015
IL:CHICAGO	0.011	0.011	0.005	0.006	0.011	0.009	0.002	0.003	0.009	0.006
MI:LANSING	0.003	0.007	0.003	0.004	0.024	0.010	0.002	0.004	0.009	0.007
MT:HELENA	0.004	0.008	0.003	0.004	0.032	0.012	0.005	0.005	0.014	0.007
ND:BISMARCK	0.004	0.011	0.010	0.007	0.063	0.020	0.009	0.007	0.048	0.017
NJ:TRENTON	0.002	0.013	0.002	0.011	0.033	0.020	-0.003	0.007	0.007	0.012
NY:NEW YORK CITY	-.002	0.019	0.011	0.011	0.064	0.027	0.004	0.010	0.028	0.021
NY:NIAGARA FALLS	0.001	0.006	0.003	0.005	0.030	0.012	0.002	0.004	0.005	0.005
OH:COLUMBUS	0.000	0.009	0.005	0.006	0.026	0.011	0.000	0.000	0.016	0.008
OH:PAINESVILLE	0.008	0.008	0.007	0.007	0.018	0.009	0.004	0.004	0.008	0.007
OR:PORTLAND	0.004	0.008	0.000	0.006	0.011	0.009	0.002	0.005	0.008	0.007
PA:HARRISBURG	0.002	0.016	0.004	0.008	0.054	0.021	0.004	0.008	0.008	0.011
SC:BARNWELL	0.003	0.010	0.000	0.004	0.044	0.015	0.009	0.007	0.027	0.011
SC:COLUMBIA	-.001	0.008	0.008	0.006	0.019	0.010	0.001	0.004	0.011	0.007
VA:LYNCHBURG	0.005	0.011	0.020	0.012	0.124	0.035	0.004	0.010	0.013	0.010
WV:CHARLESTON	0.004	0.010	-0.003	0.003	0.018	0.009	0.005	0.004	0.005	0.004

THE MINIMUM DETECTABLE LIMIT IS .015 pCi/SAMPLE, FOR EACH INDIVIDUAL ISOTOPE.

s SIGMA COUNTING ERROR

Krypton-85

Krypton-85 is a long-lived noble gas with a half life of 10.8 years. It is released into the atmosphere by nuclear reactor operations, fuel fabrication, fuel reprocessing, and nuclear detonations. Krypton-85 also occurs naturally in minor quantities primarily from the neutron capture of stable krypton-84 as well as spontaneous fission and neutron-induced fission of uranium. Monitoring of krypton-85 in the atmosphere has been conducted to identify and establish baseline levels and long-term trends.

Krypton-85 analysis began in January 1973 with sample collections and analyses being performed for 12 sampling locations. These locations were selected to provide atmospheric coverage of the United States with considerations being given to the proximity to fuel reprocessing plants, nuclear reactors, and wide geographic coverage.

Dry compressed air samples, collected at each location, are purchased from commercial air suppliers annually and shipped to the EERF where the krypton-85 is cryogenically separated and counted in a liquid scintillation system.

Results will be published when available.

ERAMS

SECTION II. Water Program

The ERAMS water program provides ambient radiation data to assess the effects of the nuclear power industry, the natural radiation environment, and other nuclear sources on the nation's rivers, streams and drinking water supplies.

Surface Water

Grab samples are taken quarterly at 58 stations located downstream from operating or future nuclear facilities.

Surface water monitoring consists of tritium analyses quarterly and gamma scans annually. Tritium is the primary radioactive pollutant from nuclear power plants.

Tritium concentrations are determined by liquid scintillation counting of distilled samples. Gamma scans are performed annually to determine if there is a buildup of other contaminants.

Tritium concentrations for surface water samples for January - March 1982 are given in Table 11.

TABLE 11

SURFACE WATER
TRITIUM CONCENTRATION

JANUARY - MARCH 1982

LOCATION	SOURCE	DATE COLLECTED	nCi/l	± 2s
AL:DECATUR	TENNESSEE RIVER	1/ 6/82	0.4	0.2
AL:DOTHAN	CHATTAHOOCHIE RIVER	1/ 5/82	0.2	0.2
AL:SCOTTSBORO	TENNESSEE RIVER	1/ 6/82	0.3	0.2
AR:LITTLE ROCK	ARKANSAS RIVER	2/24/82	0.3	0.2
CA:CLAY STATION	FOLSOM S. CANAL	1/22/82	0.3	0.2
CA:DIABLO CANYON	PACIFIC OCEAN	1/ 8/82	0.2	0.2
CA:EUREKA	HUMBOLDT BAY	1/ 7/82	0.2	0.2
CA:SAN ONOFRE	PACIFIC OCEAN	2/24/82	0.3	0.2
CO:GREELEY	SOUTH PLATTE RIVER	3/19/82	13.0	0.4
CT:EAST HADDAM	CONNECTICUT RIVER	1/28/82	0.3	0.2
CT:WATERFORD	LONG ISLAND SOUND	1/28/82	0.3	0.2
FL:CRYSTAL R.	GULF OF MEXICO	1/11/82	0.2	0.2
FL:FT. PIERCE	ATLANTIC OCEAN	3/ 3/82	0.2	0.2
FL:HOMESTEAD	BISCAYNE BAY	3/ 9/82	0.3	0.2
IA:CEDAR RAPIDS	CEDAR RIVER	1/12/82	0.2	0.2
ID:BUHL	SNAKE RIVER	1/28/82	0.2	0.2
IL:MARSEILLES	ILLINOIS RIVER	1/ 1/82	0.4	0.2
IL:MORRIS	ILLINOIS RIVER	1/18/82	0.4	0.2
IL:OREGON	ROCK RIVER	2/15/82	0.3	0.2
IL:ZION	LAKE MICHIGAN	3/31/82	0.4	0.2
LA:NEW ORLEANS	MISSISSIPPI RIVER	1/ 4/82	0.2	0.2
MA:PLYMOUTH	CAPE CODE BAY	1/12/82	0.3	0.2
MA:ROWE	DEERFIELD RIVER	3/31/82	0.3	0.2
MD:CONOWINGO	SUSQUEHANNA RIVER	1/12/82	0.3	0.2
MD:LUSBY	CHESAPEAKE BAY	2/ 2/82	0.4	0.2
ME:WISCASSET	MONTSEWAY BAY	1/12/82	0.3	0.2
MI:BRIDGMAN	LAKE MICHIGAN	2/ 1/82	0.3	0.2
MI:CHARLEVOIX	LAKE MICHIGAN	1/ 9/82	1.2	0.2
MI:MONROE	LAKE ERIE	1/18/82	0.4	0.2
MI:SO. HAVEN	LAKE MICHIGAN	2/ 2/82	0.4	0.2
MN:MONTICELLO	MISSISSIPPI RIVER	2/ 4/82	0.4	0.2
MN:RED WING	MISSISSIPPI RIVER	1/18/82	0.2	0.2
MS:PORT GIBSON	MISSISSIPPI RIVER	1/21/82	0.2	0.2
NC:CHARLOTTE	CATAWBA RIVER	1/11/82	0.5	0.2
NC:SOUTHPORT	ATLANTIC OCEAN	1/ 5/82	0.3	0.2
NJ:BAYSIDE	DELAWARE RIVER	1/12/82	0.4	0.2
NJ:OYSTER CREEK	OYSTER CREEK	1/21/82	0.3	0.2
NV:BOULDER CITY	COLORADO RIVER	1/13/82	0.3	0.2
NY:OSSINING	HUDSON RIVER	3/31/82	0.3	0.2
NY:OSWEGO	LAKE ONTARIO	1/ 7/82	0.3	0.2
NY:POUGHKEEPSIE	HUDSON RIVER	1/20/82	0.3	0.2
OH:TOLEDO	LAKE ERIE	1/ 6/82	0.3	0.2
OR:BRADWOOD	COLUMBIA RIVER	2/15/82	0.2	0.2

TABLE 11 (CONTINUED)

SURFACE WATER
TRITIUM CONCENTRATION

JANUARY - MARCH 1982

LOCATION	SOURCE	DATE COLLECTED	nCi/l	± 2s
PA:DANVILLE	SUSQUEHANNA RIVER	1/ 6/82	0.4	0.2
SC:ALLENDALE	SAVANNAH RIVER	1/27/82	4.9	0.3
SC:BROAD R.	BROAD RIVER	1/29/82	0.4	0.2
SC:HARTSVILLE	LAKE ROBINSON	1/ 4/82	1.3	0.2
TN:KINGSTON	CLINCH RIVER	1/ 4/82	4.2	0.3
TN:DAISY	TENNESSEE RIVER	2/24/82	0.6	0.2
TX:EL PASO	RIO GRANDE	1/26/82	0.4	0.2
TX:MATAGORDA	COLORADO RIVER	1/21/82	0.2	0.2
VA:DOSWELL	NORTH ANNA RIVER	1/ 8/82	3.5	0.2
VA:NEWPORT NEWS	JAMES RIVER	3/ 1/82	0.7	0.2
VT:VERNON	CONNECTICUT RIVER	3/29/82	0.3	0.2
WA:NORTHPORT	COLUMBIA RIVER	1/13/82	0.2	0.2
WA:RICHLAND	COLUMBIA RIVER	1/13/82	0.3	0.2
WI:TWO CREEKS	LAKE MICHIGAN	1/11/82	0.6	0.2
WI:VICTORY	MISSISSIPPI RIVER	1/29/82	0.5	0.2
WV:WHEELING	OHIO RIVER	1/ 7/82	0.4	0.2

s SIGMA COUNTING ERROR

Drinking Water

The drinking water program provides ambient radiation monitoring relevant to the effects of the nuclear power industry, natural environmental levels, and other pertinent sources. These data serve to assess trends and anomalies in concentrations, and to compare with standards set forth in the EPA "National Interim Primary Drinking Water Regulations." These regulations provide for approval of supplies when the combined radium-226 and radium-228 levels do not exceed 5 pCi/l, when the gross alpha (excluding radon and uranium) levels do not exceed 15 pCi/l, when tritium levels do not exceed 20,000 pCi/l, when the strontium-90 levels do not exceed 8 pCi/l, and when the gross beta levels do not exceed 50 pCi/l.

Grab samples are taken at 78 sites which are either major population centers or selected nuclear facility environs.

The analyses include (a) tritium on a quarterly basis (b) gross alpha, gross beta, and strontium-90 on annual composites (gamma analyses are performed if the gross beta activity is greater than 10 pCi/l; radium-226 analyses are performed if the gross alpha exceeds 2 pCi/l; and radium-228 analyses are performed if the radium-226 activity falls between 3 and 5 pCi/l) (c) specific iodine-131 is performed on one quarterly sample per year for each station (d) an annual composite for plutonium-238, -239, uranium-234, -235, -238, for stations which demonstrate gross alpha levels greater than 2 pCi/l.

Tritium analyses are performed by scintillation counting of the distilled samples, gross beta, and gross alpha by evaporating an aliquot on stainless steel planchets for counting, and radium-226 by the standard emanation technique. Strontium-90 is determined by beta counting a strontium carbonate precipitate isolated by ion exchange.

The results of tritium in drinking water analyses for January - March 1982 are shown in Table 12.

The annual alpha, beta, gamma, radium, and strontium analyses for 1981 annual drinking water samples are shown in Table 13.

All samples were taken as either a single grab sample or composite samples taken over 12 to 14 days.

Radon-222 in Drinking Water

Radon-222 in drinking water has previously been considered a source of radiation exposure primarily from an ingestion standpoint. The Office of Radiation Programs (ORP) of the U.S. Environmental Protection Agency (EPA) is investigating radon in water supplies to evaluate the possibility that a major pathway from inhalation

exposure may exist in addition to the ingestion pathway. As an inert gas, radon is not chemically bound to the water and consequently can be released during any operation that aerates or agitates water. Depending upon the initial concentration of radon in water, significant quantities of radon could be released in a home or to the general environment.

To determine the scope of this potential problem, a national ground water sampling program has been initiated by the Eastern Environmental Radiation Facility (EERF) to obtain data on radon concentrations in water supplies throughout the country. Sampling kits have been assembled by EERF and distributed to various state health departments. The kit is designed so that state personnel can collect samples from potable water supplies and ship them, without loss of radon other than radioactive decay, to EERF for analysis.

The selection of water supplies to be sampled is handled by two separate methods. Method 1 in which each state collects samples from all groundwater supplies serving at least 1000 people and Method 2 in which the choice of sampling locations and the number of supplies to be sampled is left to the discretion of the state programs. Each state is asked to obtain a representative sampling of ground water supplies within its boundaries. The extent of the sampling efforts and how representative the data are for a given state is determined primarily by the amount of time each state devotes to the program.

The concentrations of radon in water are determined at the EERF by liquid scintillation counting. The limit of detection for this technique using a 50-minute count and a 10-ml sample is 0.16 pCi or 16 pci/l.

The sampling kits are being provided to the various states on a rotating schedule. This schedule is designed to cover the U.S. within approximately two years. As data from each state are compiled they will be published in ERD.

TABLE 12

DRINKING WATER
TRITIUM CONCENTRATION

JANUARY - MARCH 1982

LOCATION	DATE COLLECTED	nCi/l	± 2s
AK:FAIRBANKS	1/12/82	0.3	0.2
AL:DOTHAN	1/ 5/82	0.3	0.2
AL:MONTGOMERY	1/ 6/82	0.3	0.2
AL:MUSCLE SHOALS	1/ 7/82	0.4	0.2
AL:SCOTTSBORO	1/ 6/82	0.2	0.2
AR:LITTLE ROCK	2/24/82	0.2	0.2
CA:BERKELEY	1/ 5/82	0.2	0.2
CA:LOS ANGELES	1/ 4/82	0.3	0.2
CO:DENVER	3/22/82	0.3	0.2
CO:PLATTEVILLE	3/19/82	0.4	0.2
CT:HARTFORD	1/ 7/82	0.2	0.2
DE:DOVER	1/ 6/82	0.3	0.2
FL:MIAMI	1/ 4/82	0.2	0.2
FL:TAMPA	1/11/82	0.2	0.2
GA:SAVANNAH	1/26/82	3.8	0.3
HI:HONOLULU	2/ 5/82	0.2	0.2
IA:CEDAR RAPIDS	1/11/82	0.5	0.2
ID:BOISE	1/ 5/82	0.3	0.2
ID:IDAHO FALLS	1/ 7/82	0.3	0.2
IL:MORRIS	1/ 5/82	0.2	0.2
IL:W. CHICAGO	1/ 6/82	0.2	0.2
KS:TOPEKA	1/ 4/82	0.5	0.2
LA:NEW ORLEANS	3/ 4/82	0.5	0.2
MA:LAWRENCE	1/19/82	0.2	0.2
MA:ROWE	3/31/82	0.3	0.2
MD:BALTIMORE	1/ 6/82	0.4	0.2
MD:CONOWINGO	1/12/82	0.2	0.2
ME:AUGUSTA	1/ 6/82	0.2	0.2
MI:DETROIT	1/13/82	0.3	0.2
MI:GRAND RAPIDS	1/13/82	0.3	0.2
MN:MINNEAPOLIS	1/ 6/82	0.3	0.2
MN:RED WING	1/12/82	0.3	0.2
MS:JACKSON	1/ 5/82	0.4	0.2
MS:PORT GIBSON	1/25/82	0.3	0.2
MT:HELENA	1/ 8/82	0.3	0.2
NC:CHARLOTTE	1/20/82	0.4	0.2
NC:WILMINGTON	1/ 7/82	0.3	0.2
ND:BISMARCK	1/11/82	0.4	0.2
NE:LINCOLN	1/11/82	0.3	0.2
NH:CONCORD	1/ 5/82	0.3	0.2
NJ:TRENTON	1/25/82	0.4	0.2
NJ:WARETOWN	1/21/82	0.2	0.2
NM:SANTA FE	1/ 6/82	0.2	0.2
NV:LAS VEGAS	1/ 6/82	0.3	0.2

TABLE 12 (CONTINUED)

DRINKING WATER
TRITIUM CONCENTRATION

JANUARY - MARCH 1982

LOCATION	DATE COLLECTED	nCi/l	± 2s
NY:ALBANY	1/ 5/82	0.3	0.2
NY:NEW YORK CITY	1/11/82	0.2	0.2
NY:NIAGARA FALLS	1/22/82	0.2	0.2
NY:SYRACUSE	1/26/82	0.2	0.2
OH:CINCINNATI	3/30/82	0.2	0.2
OH:COLUMBUS	3/ 2/82	0.4	0.2
OH:EAST LIVERPOOL	2/10/82	0.4	0.2
OH:PAINESVILLE	1/14/82	0.4	0.2
OH:TOLEDO	1/ 6/82	0.4	0.2
OK:OKLAHOMA CITY	1/ 8/82	0.3	0.2
OR:PORTLAND	1/11/82	0.2	0.2
PA:COLUMBIA	1/ 7/82	0.4	0.2
PA:HARRISBURG	1/14/82	0.2	0.2
PA:PITTSBURGH	2/10/82	0.4	0.2
PC:ANCON	1/ 7/82	0.2	0.2
RI:PROVIDENCE	1/ 4/82	0.3	0.2
SC:BARNWELL	1/27/82	0.3	0.2
SC:COLUMBIA	1/ 5/82	0.4	0.2
SC:HARTSVILLE	1/ 4/82	0.2	0.2
SC:JENKINSVILLE	1/22/82	0.3	0.2
SC:SENECA	1/26/82	0.2	0.2
TN:CHATTANOOGA	3/19/82	0.4	0.2
TN:KNOXVILLE	1/ 4/82	0.4	0.2
TX:AUSTIN	1/ 5/82	0.3	0.2
VA:DOSWELL	2/ 1/82	0.4	0.2
VA:LYNCHBURG	1/ 5/82	0.2	0.2
VA:VIRGINIA BEACH	1/ 5/82	0.3	0.2
WA:RICHLAND	1/13/82	0.4	0.2
WA:SEATTLE	1/15/82	0.3	0.2
WI:GENOA CITY	1/13/82	0.2	0.2
WI:MADISON	1/15/82	0.1	0.2

s SIGMA COUNTING ERROR

TABLE 13

DRINKING WATER
ALPHA, BETA AND GAMMA CONCENTRATION

1981

ANNUAL ANALYSES

LOCATION	TOTAL SOLIDS mg/1	GROSS BETA DATE CTD. pCi/1 ± 2s	GROSS ALPHA DATE CTD. pCi/1 ± 2s	^{90}Sr pCi/1 ± 2s	^{226}Ra pCi/1 ± 2s	SPECIFIC GAMMA ACTIVITY
AK:FAIRBANKS	162.0	2.2 1.2 2/ 4/82	0.0 0.0 2/ 4/82	0.2 0.5	NA	NA
AL:DOTHAN	136.2	1.7 0.9 2/ 4/82	0.5 0.6 2/ 4/82	0.1 0.2	NA	NA
AL:MONTGOMERY	58.2	1.0 0.8 2/ 4/82	0.0 0.2 2/ 4/82	0.3 0.4	NA	NA
AL:MUSCLE SHOALS	112.2	1.6 1.0 2/ 4/82	0.0 0.0 2/ 4/82	0.3 0.3	NA	NA
AL:SCOTTSBORO	120.4	1.7 0.9 2/ 4/82	-0.1 0.3 2/ 4/82	0.4 0.4	NA	NA
AR:LITTLE ROCK	26.8	0.6 0.7 2/ 4/82	0.1 0.2 2/ 4/82	0.2 0.1	NA	NA
CA:BERKELEY	37.6	0.5 0.8 2/ 4/82	-0.2 0.2 2/ 4/82	-0.1 0.1	NA	NA
CA:LOS ANGELES	332.0	3.6 2.0 2/ 4/82	2.7 1.5 2/ 4/82	0.0 0.1	0.1 0.0	NA
CO:DENVER	159.6	2.8 0.9 2/ 4/82	3.7 1.0 2/ 4/82	0.0 0.0	0.1 0.0	NA
CO:PLATTEVILLE	740.0	4.7 3.4 2/ 4/82	4.9 3.1 2/ 4/82	0.0 0.0	0.3 0.0	NA
CT:HARTFORD	41.0	1.2 0.8 2/ 5/82	0.1 0.2 2/ 5/82	0.4 0.4	NA	NA
DE:WILMINGTON	131.4	3.2 1.0 2/ 5/82	-0.2 0.4 2/ 5/82	0.1 0.1	NA	NA

TABLE 13 (CONTINUED)

DRINKING WATER
ALPHA, BETA AND GAMMA CONCENTRATION

1981

ANNUAL ANALYSES

LOCATION	TOTAL SOLIDS mg/l	GROSS BETA DATE CTD. pCi/l ± 2s	GROSS ALPHA DATE CTD. pCi/l ± 2s	^{90}Sr pCi/l ± 2s	^{226}Ra pCi/l ± 2s	SPECIFIC GAMMA ACTIVITY
FL:MIAMI	163.5	1.3 1.0 2/ 5/82	0.3 0.6 2/ 5/82	0.0 0.0	NA	NA
FL:TAMPA	261.0	1.2 1.9 2/ 5/82	0.3 0.9 2/ 5/82	0.1 0.1	NA	NA
GA:BAXLEY	154.3	3.2 1.1 2/ 5/82	1.9 0.8 2/ 5/82	0.1 0.2	NA	NA
GA:SAVANNAH	67.8	1.1 0.8 2/ 5/82	↳0.1 0.2 2/ 5/82	0.4 0.3	NA	NA
HI:HONOLULU	171.0	2.3 1.1 2/ 5/82	↳0.3 0.5 2/ 5/82	0.2 0.2	NA	NA
IA:CEDAR RAPIDS	127.3	3.6 1.2 2/ 5/82	0.2 0.4 2/ 5/82	0.2 0.6	NA	NA
ID:BOISE	58.6	0.6 0.7 2/ 5/82	0.3 0.3 2/ 5/82	0.1 0.1	NA	NA
ID:IDAHO FALLS	199.0	2.8 1.6 2/ 5/82	0.8 0.7 2/ 5/82	↳0.2 0.4	NA	NA
IL:CHICAGO	670.0	5.0 18.0 2/25/82	10.6 9.8 2/25/82	0.1 0.3	11.5 0.1	NA
IL:MORRIS	301.0	20.3 3.2 2/10/82	12.4 2.9 2/10/82	↳0.6 1.5	7.6 0.1	NA
KS:TOPEKA	369.0	7.0 2.6 2/10/82	0.2 1.2 2/10/82	0.1 0.1	NA	NA
LA:NEW ORLEANS	211.0	3.9 1.7 2/10/82	0.6 0.7 2/10/82	0.2 0.3	NA	NA
MA:LAWRENCE	80.2	1.9 0.9 2/10/82	0.0 0.2 2/10/82	0.5 0.4	NA	NA

TABLE 13 (CONTINUED)

DRINKING WATER
ALPHA, BETA AND GAMMA CONCENTRATION

1981

ANNUAL ANALYSES

LOCATION	TOTAL SOLIDS mg/l	GROSS BETA DATE CTD. pCi/l ± 2s	GROSS ALPHA DATE CTD. pCi/l ± 2s	^{90}Sr pCi/l ± 2s	^{226}Ra pCi/l ± 2s	SPECIFIC GAMMA ACTIVITY
MA:ROWE	38.8	0.4 0.7 2/10/82	0.2 0.2 2/10/82	0.2 0.7	NA	NA
MD:BALTIMORE	126.4	2.1 1.0 2/10/82	-0.1 0.5 2/10/82	0.2 0.2	NA	NA
MD:CONOWINGO	202.0	1.2 1.3 2/10/82	0.5 0.8 2/10/82	0.1 0.1	NA	NA
ME:AUGUSTA	39.6	2.0 0.9 2/10/82	0.3 0.2 2/10/82	0.2 0.2	NA	NA
MI:DETROIT	108.2	1.3 0.8 2/10/82	0.2 0.3 2/10/82	0.8 0.6	NA	NA
MI:GRAND RAPIDS	147.3	1.6 1.0 2/10/82	0.5 0.5 2/10/82	0.8 0.4	NA	NA
MN:MINNEAPOLIS	107.2	2.4 1.0 2/10/82	0.1 0.4 2/10/82	0.3 0.3	NA	NA
MN:RED WING *	222.5	5.8 2.1 2/10/82	4.1 1.5 2/10/82	0.0 0.1	3.9 0.1	NA
MO:JEFFERSON CITY	293.5	3.2 1.9 2/10/82	3.1 1.5 2/10/82	0.1 0.1	1.3 0.0	NA
MS:JACKSON	80.2	2.2 1.0 2/10/82	0.0 0.2 2/10/82	0.2 0.2	NA	NA
MS:PORT GIBSON	341.0	2.6 1.9 2/10/82	1.3 1.2 2/10/82	-0.4 0.4	NA	NA
MT:HELENA	142.4	2.7 1.0 2/10/82	0.7 0.6 2/10/82	0.1 0.1	NA	NA
NC:CHARLOTTE	47.8	1.4 0.9 2/10/82	0.1 0.2 2/10/82	0.1 0.1	NA	NA
NC:WILMINGTON	108.0	3.2 1.1 2/17/82	0.0 0.4 2/17/82	-0.1 0.1	NA	NA
ND:BISMARCK	358.0	2.8 2.2 2/17/82	0.0 0.0 2/17/82	0.1 0.1	NA	NA

TABLE 13 (CONTINUED)

DRINKING WATER
ALPHA, BETA AND GAMMA CONCENTRATION

1981

ANNUAL ANALYSES

LOCATION	TOTAL SOLIDS mg/l	GROSS BETA DATE CTD. pCi/l + 2s	GROSS ALPHA DATE CTD. pCi/l + 2s	^{90}Sr pCi/l + 2s	^{226}Ra pCi/l + 2s	SPECIFIC GAMMA ACTIVITY
NE:LINCOLN	334.0	8.5 2.6 2/17/82	3.4 1.8 2/17/82	0.3 0.3	0.2 0.0	NA
NH:CONCORD	70.8	1.1 0.8 2/17/82	0.0 0.3 2/17/82	⌙0.4 1.4	NA	NA
NJ:TRENTON	130.0	1.3 0.9 2/17/82	0.0 0.0 2/17/82	0.1 0.1	NA	NA
NJ:WARETOWN	74.6	1.0 0.7 11/ 2/81	0.6 0.4 11/ 2/81	⌙0.1 0.2	NA	NA
NM:SANTA FE	187.0	7.3 1.2 2/17/82	15.3 2.1 2/17/82	⌙0.4 1.7	0.2 0.0	NA
NV:LAS VEGAS	699.0	7.0 4.2 2/17/82	2.3 3.0 2/17/82	0.6 0.4	0.2 0.0	NA
NY:ALBANY	80.0	1.7 0.9 2/17/82	-0.2 0.2 2/17/82	0.2 0.4	NA	NA
NY:NEW YORK CITY	44.2	2.0 0.9 2/17/82	⌙0.1 0.2 2/17/82	0.2 0.2	NA	NA
NY:NIAGARA FALLS	143.0	1.7 1.1 2/17/82	0.1 0.4 2/17/82	0.6 0.3	NA	NA
NY:SYRACUSE	131.0	2.0 0.9 2/25/82	0.3 0.5 2/25/82	0.7 0.4	NA	NA
OH:CINCINNATI	207.5	2.2 1.5 2/25/82	⌙0.2 0.6 2/25/82	0.4 0.3	NA	NA
OH:COLUMBUS	304.0	2.4 2.2 2/25/82	0.3 1.0 2/25/82	⌙0.1 0.1	NA	NA
OH:EAST LIVERPOOL	222.0	2.0 1.4 2/25/82	0.0 0.0 2/25/82	0.2 0.2	NA	NA
OH:PAINESVILLE	175.0	3.1 1.3 2/25/82	0.1 0.5 2/25/82	0.2 0.1	NA	NA

TABLE 13 (CONTINUED)

DRINKING WATER
ALPHA, BETA AND GAMMA CONCENTRATION

1981

ANNUAL ANALYSES

LOCATION	TOTAL SOLIDS mg/l	GROSS BETA DATE CTD. pCi/l ± 2s	GROSS ALPHA DATE CTD. pCi/l ± 2s	^{90}Sr pCi/l ± 2s	^{226}Ra pCi/l ± 2s	SPECIFIC GAMMA ACTIVITY
OH:TOLEDO	112.4	3.0 1.1 2/25/82	0.3 0.3 2/25/82	0.2 0.2	NA	NA
OK:OKLAHOMA CITY	184.0	3.8 1.3 2/25/82	-0.1 0.4 2/25/82	0.2 0.1	NA	NA
OR:PORTLAND	22.0	1.3 0.8 2/25/82	0.1 0.2 2/25/82	0.2 0.3	NA	NA
PA:COLUMBIA	210.3	0.6 1.0 2/25/82	-0.2 0.5 2/25/82	0.3 0.3	NA	NA
PA:HARRISBURG	33.6	1.6 0.9 2/25/82	0.0 0.0 2/25/82	0.3 0.5	NA	NA
PA:PITTSBURGH	169.0	3.0 7.0 3/ 3/82	0.3 0.7 3/ 3/82	0.2 0.3	NA	NA
PC:ANCON	75.4	1.3 0.8 2/25/82	-0.1 0.2 2/25/82	0.1 0.1	NA	NA
RI:PROVIDENCE	66.4	1.9 0.9 2/25/82	-0.1 0.2 2/25/82	0.7 0.5	NA	NA
SC:BARNWELL	30.0	1.4 0.9 2/25/82	0.1 0.2 2/25/82	0.0 0.2	NA	NA
SC:COLUMBIA	66.8	2.5 0.9 2/25/82	0.0 0.0 2/25/82	0.1 0.1	NA	NA
SC:HARTSVILLE	32.2	0.4 0.5 2/26/82	0.3 0.2 2/26/82	0.1 0.1	NA	NA
SC:JENKINSVILLE	80.4	7.1 0.9 3/ 2/82	64.0 3.0 3/ 2/82	0.1 0.1	0.3 0.0	NA
SC:SENECA	28.2	5.0 1.2 3/ 2/82	0.0 0.0 3/ 2/82	0.2 0.3	NA	NA
TN:CHATTANOOGA	114.2	1.8 0.9 3/ 2/82	0.3 0.3 3/ 2/82	0.3 0.5	NA	NA

TABLE 13 (CONTINUED)

DRINKING WATER
ALPHA, BETA AND GAMMA CONCENTRATION

1981

ANNUAL ANALYSES

LOCATION	TOTAL SOLIDS mg/l	GROSS BETA DATE CTD. pCi/l ± 2s	GROSS ALPHA DATE CTD. pCi/l ± 2s	^{90}Sr pCi/l ± 2s	^{226}Ra pCi/l ± 2s	SPECIFIC GAMMA ACTIVITY
TN:KNOXVILLE	131.2	3.8 1.1 3/ 2/82	0.2 0.4 3/ 2/82	NA	NA	NA
TX:AUSTIN	157.0	3.4 1.3 3/ 2/82	0.1 0.6 3/ 2/82	0.0 0.1	NA	NA
VA:LYNCHBURG	87.0	1.9 0.9 3/ 2/82	0.1 0.3 3/ 2/82	0.1 0.1	NA	NA
VA:VIRGINIA BEACH	189.0	3.8 1.4 3/ 2/82	0.7 0.7 3/ 2/82	0.4 0.3	NA	NA
VA:DOSWELL	140.0	2.6 1.1 3/ 2/82	0.2 0.3 3/ 2/82	0.3 0.6	NA	NA
VI:ST. THOMAS	66.0	1.1 0.8 3/ 2/82	0.0 0.2 3/ 2/82	0.0 0.1	NA	NA
WA:RICHLAND	73.0	1.2 0.8 3/ 2/82	0.1 0.3 3/ 2/82	0.2 0.2	NA	NA
WA:SEATTLE	31.0	0.3 0.8 3/ 2/82	0.0 0.0 3/ 2/82	-0.1 0.1	NA	NA
WI:GENOA CITY	173.0	1.6 1.0 3/ 2/82	0.6 0.7 3/ 2/82	0.4 0.3	NA	NA
WI:MADISON	217.0	3.8 1.6 3/ 2/82	1.2 0.8 3/ 2/82	0.2 0.2	NA	NA

* 228Ra RESULTS FOR MN:RED WING 4.9 pCi/l ± 0.98

ND NO ACTIVITY DETECTABLE
NA NO ANALYSIS
s SIGMA COUNTING ERROR

SECTION III. External Gamma Ambient Monitoring Program

The external gamma monitoring program, which began in October 1978, provides a continuous measurement of ambient gamma exposure rates, including cosmic, at selected sites throughout the continental United States. Data from this program will be used to evaluate fluctuations in natural background due to variations in environmental conditions and to provide a means of monitoring any significant increases in ambient gamma levels due to weapons fallout, reactor operations, etc. Initially, the program will consist of approximately 22 sites representing a wide geographic coverage throughout the country. Hopefully, at some later date additional sites will be added to the program. Although exposure measurements at these few sites are not totally representative of nationwide exposures, they will be indicative of national trends.

The monitoring program utilizes CaF_2:Mn thermoluminescent dosimeters (TLD's). These dosimeters are commercially available glass-bulb type dosimeters with energy compensating shields. A group of four TLD's is located at each station or site. Dosimeters are annealed by the station operator prior to positioning in the field. The dosimeters are returned to EERF for readout on an approximate one-month cycle. Several dosimeters are annealed by the station operator as controls and returned with the exposed field dosimeters to correct for any exposures accumulated during shipment.

Results from the period January - March 1982 are shown in Table 14.

TABLE 14

ENVIRONMENTAL GAMMA AMBIENT MONITORING PROGRAM

LOCATION	DATE RANGE	INTEGRATED EXPOSURE	EXPOSURE RATE	
		MR	MICRO R/HR	± 2 s
AL:MONTGOMERY	10482- 20382	7.8	10.9	3.4
AL:MONTGOMERY	20382- 30382	7.6	11.4	3.8
AL:MONTGOMERY	30382- 40682	8.4	10.4	9.7
CA:BERKELEY	10482- 20182	6.1	9.1	5.2
CA:BERKELEY	20182- 30182	3.9	5.8	17.7
CA:BERKELEY	30182- 40182	4.3	5.8	5.7
CO:DENVER	10882- 20382	9.5	15.3	8.3
CO:DENVER	20382- 30482	10.3	14.8	3.9
CO:DENVER	30482- 40182	11.8	17.5	5.7
FL:ORLANDO	10482- 20982	8.4	9.8	4.0
FL:ORLANDO	20982- 32882	4.6	4.1	6.6
ID:BOISE	20582- 30482	6.8	10.5	8.2
ID:BOISE	30482- 40582	9.0	11.7	4.9
IL:CHICAGO	10582- 20582	5.4	7.2	5.4
IL:CHICAGO	20582- 30582	4.5	6.8	6.1
IL:CHICAGO	30582- 40782	5.7	7.4	4.4
ND:BISMARCK	11282- 20282	4.2	8.3	3.9
ND:BISMARCK	20282- 30182	5.3	8.2	13.0
NJ:TRENTON	20182- 30182	6.0	9.0	4.3
NJ:TRENTON	30182- 40182	7.5	10.1	6.7
NM:SANTA FE	20482- 30582	9.5	13.7	3.6
NM:SANTA FE	30582- 40582	10.6	14.3	2.9
NV:LAS VEGAS	12982- 30182	5.4	7.3	8.3
NV:LAS VEGAS	30182- 40182	5.2	6.9	8.9
NY:NEW YORK	10582- 21082	6.3	7.3	4.9
NY:NEW YORK	21082- 30282	3.5	7.2	20.4
NY:NEW YORK	30282- 40582	6.4	7.9	3.4
OH:COLUMBUS	123181- 20382	5.6	6.8	6.7
OH:COLUMBUS	20382- 30182	4.2	6.8	9.1
OH:COLUMBUS	30182- 40282	5.4	7.1	6.6
OR:PORTLAND	10582- 20382	5.7	8.2	6.2
OR:PORTLAND	20382- 30282	5.3	8.2	6.6
PA:HARRISBURG	12982- 22582	3.8	5.9	6.5
PA:PITTSBURGH	10582- 20182	8.4	13.0	5.1
PA:PITTSBURGH	20182- 30282	8.8	12.6	3.1
RI:PROVIDENCE	11282- 20482	5.6	10.2	4.4
RI:PROVIDENCE	20482- 30482	7.5	11.2	6.1
RI:PROVIDENCE	30482- 40582	7.8	10.1	4.7
SC:BARNWELL	12882- 30482	6.4	7.6	6.8
SC:BARNWELL	30482- 40182	5.6	8.3	5.6
SC:COLUMBIA	12982- 22682	5.8	8.6	4.9
SC:COLUMBIA	22682- 40282	7.2	8.6	5.3
TN:KNOXVILLE	12882- 40282	13.6	8.8	4.4
VA:RICHMOND	123181- 20182	6.7	9.0	5.4
VA:RICHMOND	10282- 30182	6.0	8.9	11.9
VA:RICHMOND	30182- 40182	6.7	9.0	5.4
VT:MONTPELIER	122882- 11882	3.9	7.8	4.4
VT:MONTPELIER	11882- 21782	5.1	7.1	6.6
VT:MONTPELIER	21782- 32282	5.8	7.4	7.9
VT:MONTPELIER	32282- 40182	1.7	7.2	7.8

s = SIGMA ERROR (IN PERCENT)

SECTION IV. Milk Program

Pasteurized Milk

This is a cooperative program of the EPA, ORP and the Dairy and Lipid Products Branch, Milk Sanitation Section, Food and Drug Administration. Milk is a reliable indicator of the general populations intake of radionuclides since it is consumed by a large segment of the population and contains several of the biologically important contaminants resulting from environmental releases from nuclear activities. A primary function of this program is to obtain reliable monitoring data relative to current radionuclide concentrations and determine any long-term trends.

Monthly samples are collected at 65 sampling sites with one or more located in each state, Puerto Rico, and the Panama Canal. These are composite samples representing more than 80 percent of the milk consumed in a given population center.

These samples are analyzed for iodine-131, barium-140, cesium-137, and potassium. All 65 samples are analyzed annually in July for strontium-89, and strontium-90. Also, for the first month of the three quarters beginning January, April and October, 10 regional composite samples of milk made up from the states within each of EPA's 10 regions are analyzed for strontium-89 and strontium-90.

Iodine-131, barium-140, cesium-137 and potassium are determined by gamma spectral analysis. Strontium-89 and strontium-90 are determined by beta counting a total strontium precipitate which has been chemically separated by ion-exchange.

The values from the pasteurized milk samples for January - March 1982 are shown in Tables 15 - 17. Strontium values from regional composite samples collected January - March 1982 are shown in Table 18.

Tritium in Milk

It was previously proposed to analyze all 65 milk samples for tritium in the aqueous and organic phases, on an annual basis (on the April sample). The EERF is currently evaluating alternative analytical techniques anticipating that these analyses will begin during the coming year.

TABLE 15

CONCENTRATIONS OF RADIONUCLIDES IN PASTEURIZED MILK

JANUARY 1982

LOCATION	DATE COLLECTED	K g/l±2s	^{137}Cs pCi/l±2s	^{140}Ba pCi/l±2s	^{131}I pCi/l±2s
AL:MONTGOMERY	1/ 7/82	1.48 0.12	-5. 7.	-1. 8.	-2. 7.
AR:LITTLE ROCK	1/ 4/82	1.44 0.08	6. 5.	0. 6.	1. 5.
AZ:PHOENIX	1/ 6/82	1.34 0.12	-2. 7.	1. 8.	0. 7.
CA:LOS ANGELES	1/12/82	1.34 0.12	1. 7.	-2. 8.	1. 7.
CA:SACRAMENTO	1/ 8/82	1.48 0.12	0. 7.	2. 8.	-1. 7.
CA:SAN FRANCISCO	1/ 7/82	1.42 0.08	-1. 5.	-8. 6.	0. 5.
CO:DENVER	1/27/82	1.36 0.12	-1. 7.	-8. 8.	0. 7.
CT:HARTFORD	1/ 4/82	1.42 0.12	3. 7.	0. 8.	-1. 7.
DC:WASHINGTON	1/ 8/82	1.41 0.12	7. 7.	-6. 8.	5. 7.
DE:WILMINGTON	1/ 4/82	1.44 0.12	-5. 7.	2. 8.	-7. 7.
FL:TAMPA	1/ 4/82	1.38 0.12	14. 7.	-5. 8.	-1. 7.
GA:ATLANTA	1/ 6/82	1.39 0.12	0. 7.	-2. 8.	-3. 7.
HI:HONOLULU	1/ 6/82	1.37 0.12	19. 7.	1. 8.	0. 7.
IA:DES MOINES	1/ 4/82	1.45 0.08	-3. 5.	-4. 6.	3. 5.
ID:IDAHO FALLS	1/12/82	1.42 0.12	7. 7.	6. 8.	-3. 7.
IL:CHICAGO	1/ 4/82	1.35 0.12	-3. 7.	-1. 8.	4. 7.
IN:INDIANAPOLIS	1/ 4/82	1.27 0.12	2. 7.	-4. 8.	0. 7.
KS:WICHITA	1/ 6/82	1.38 0.12	3. 7.	4. 8.	-2. 7.
KY:LOUISVILLE	1/ 4/82	1.38 0.12	5. 7.	2. 8.	5. 7.
MA:BOSTON	1/ 5/82	1.40 0.12	3. 7.	-4. 8.	0. 7.
MD:BALTIMORE	1/ 4/82	1.41 0.08	4. 5.	-1. 6.	0. 5.
ME:PORTLAND	1/ 5/82	1.40 0.22	20. 15.	6. 20.	-3. 13.
MI:DETROIT	1/ 7/82	1.39 0.12	2. 7.	0. 8.	1. 7.
MI:GRAND RAPIDS	1/ 4/82	1.43 0.12	4. 7.	-8. 8.	3. 7.
MN:MINN./ST. PAUL	1/ 6/82	1.42 0.12	-3. 7.	-5. 8.	-3. 7.
MO:KANSAS CITY	1/ 8/82	1.28 0.12	-2. 7.	3. 8.	-3. 7.
MO:ST. LOUIS	1/ 6/82	1.39 0.12	4. 7.	1. 8.	1. 7.
MT:HELENA	1/ 5/82	1.41 0.08	5. 5.	-4. 6.	0. 5.
NC:CHARLOTTE	1/ 4/82	1.36 0.12	4. 7.	-1. 8.	-2. 7.
NE:OMAHA	1/ 7/82	1.19 0.11	-1. 7.	-2. 8.	1. 7.
NH:MANCHESTER	1/ 4/82	1.44 0.08	0. 5.	-1. 6.	0. 5.
NJ:TRENTON	1/ 7/82	1.46 0.12	5. 7.	4. 8.	2. 7.
NM:ALBUQUERQUE	1/ 4/82	1.32 0.12	2. 7.	-7. 8.	1. 7.
NV:LAS VEGAS	1/ 5/82	1.40 0.12	3. 7.	-7. 8.	2. 7.
NY:BUFFALO	1/ 4/82	1.41 0.12	2. 7.	-5. 8.	1. 7.
NY:NEW YORK CITY	1/ 4/82	1.33 0.12	1. 7.	2. 8.	6. 7.
NY:SYRACUSE	1/ 4/82	1.40 0.08	6. 5.	-6. 6.	0. 5.
OH:CINCINNATI	1/ 4/82	1.35 0.08	6. 5.	1. 6.	2. 5.
OH:CLEVELAND	1/11/82	1.35 0.12	3. 7.	-1. 8.	-4. 7.
OR:PORTLAND	1/11/82	1.40 0.08	3. 5.	-2. 6.	0. 5.
PA:PHILADELPHIA	1/ 4/82	1.34 0.12	7. 7.	1. 8.	-1. 7.
PA:PITTSBURGH	1/ 6/82	1.37 0.12	5. 7.	-1. 8.	5. 7.
PC:CRISTOBAL	1/ 5/82	1.35 0.12	14. 7.	-6. 8.	1. 7.
PR:SAN JUAN	1/15/82	1.59 0.12	3. 7.	-4. 8.	1. 7.

TABLE 15 (CONTINUED)

CONCENTRATIONS OF RADIONUCLIDES IN PASTEURIZED MILK

JANUARY 1982

LOCATION	DATE COLLECTED	K g/l±2s	^{137}Cs pCi/l±2s	^{140}Ba pCi/l±2s	^{131}I pCi/l±2s
SC:CHARLESTON	1/28/82	1.41 0.22	0. 15.	-22. 19.	10. 13.
SD:RAPID CITY	1/ 7/82	1.44 0.12	2. 7.	-3. 8.	2. 7.
TN:CHATTANOOGA	1/ 4/82	1.52 0.12	0. 7.	0. 8.	0. 7.
TN:KNOXVILLE	1/ 4/82	1.38 0.08	2. 5.	-6. 6.	0. 5.
UT:SALT LAKE CITY	1/ 6/82	1.30 0.12	0. 7.	-2. 8.	-2. 7.
VA:NORFOLK	1/ 8/82	1.54 0.12	2. 7.	-2. 8.	0. 7.
VT:BURLINGTON	1/ 4/82	1.43 0.12	3. 7.	-1. 8.	0. 7.
WA:SEATTLE	1/ 4/82	1.38 0.12	0. 7.	-8. 8.	2. 7.
WI:MILWAUKEE	1/ 5/82	1.44 0.12	2. 7.	-6. 8.	2. 7.
WV:CHARLESTON	1/12/82	1.37 0.12	4. 7.	-2. 8.	7. 7.
WY:LARAMIE	1/13/82	1.37 0.12	1. 7.	-3. 8.	0. 7.

s SIGMA COUNTING ERROR

TABLE 16

CONCENTRATIONS OF RADIONUCLIDES IN PASTEURIZED MILK

FEBRUARY 1982

LOCATION	DATE COLLECTED	K g/l±2s	^{137}Cs pCi/l±2s	^{140}Ba pCi/l±2s	^{131}I pCi/l±2s
AL:MONTGOMERY	2/ 4/82	1.42 0.12	3. 7.	-7. 8.	-1. 7.
AR:LITTLE ROCK	2/ 1/82	1.36 0.12	5. 7.	-6. 8.	-3. 7.
AZ:PHOENIX	2/10/82	1.41 0.12	2. 7.	-6. 8.	5. 7.
CA:LOS ANGELES	2/16/82	1.42 0.12	-1. 7.	-5. 8.	3. 7.
CA:SACRAMENTO	2/ 1/82	1.39 0.08	4. 5.	-7. 6.	2. 5.
CA:SAN FRANCISCO	2/ 3/82	1.32 0.12	5. 7.	-2. 8.	0. 7.
CO:DENVER	2/23/82	1.33 0.12	6. 7.	-9. 8.	3. 7.
CT:HARTFORD	2/ 1/82	1.42 0.08	14. 5.	0. 6.	-2. 5.
DC:WASHINGTON	2/ 5/82	1.27 0.12	6. 7.	-8. 8.	-2. 7.
DE:WILMINGTON	2/ 8/82	1.40 0.12	4. 7.	-6. 8.	4. 7.
FL:TAMPA	2/ 1/82	1.36 0.12	8. 7.	-8. 8.	5. 7.
GA:ATLANTA	2/15/82	1.34 0.12	5. 7.	-10. 8.	-1. 7.
HI:HONOLULU	2/ 2/82	1.30 0.12	5. 7.	-8. 8.	3. 7.
IA:DES MOINES	2/ 8/82	1.39 0.22	0. 15.	-4. 19.	-1. 13.
ID:IDAHO FALLS	2/ 3/82	1.35 0.22	5. 15.	-20. 19.	6. 13.
IL:CHICAGO	2/ 1/82	1.40 0.08	9. 5.	-2. 6.	0. 5.
IN:INDIANAPOLIS	2/ 8/82	1.29 0.12	6. 7.	-2. 8.	-3. 7.
KS:WICHITA	2/ 4/82	1.37 0.08	5. 5.	-4. 6.	0. 5.
KY:LOUISVILLE	2/ 1/82	1.34 0.08	5. 5.	-6. 6.	-2. 5.
MA:BOSTON	2/ 9/82	1.50 0.12	1. 7.	-1. 8.	-3. 7.
MD:BALTIMORE	2/ 5/82	1.39 0.12	0. 7.	-3. 8.	0. 7.
ME:PORTLAND	2/ 2/82	1.45 0.22	4. 15.	-3. 20.	0. 13.
MI:GRAND RAPIDS	2/ 8/82	1.33 0.12	8. 7.	-3. 8.	-1. 7.
MN:MINN./ST. PAUL	2/ 2/82	1.35 0.12	3. 7.	-3. 8.	1. 7.
MO:KANSAS CITY	2/12/82	1.46 0.12	5. 7.	-3. 8.	-3. 7.
MO:ST. LOUIS	2/10/82	1.40 0.12	5. 7.	-4. 8.	0. 7.
MS:JACKSON	2/ 1/82	1.37 0.12	6. 7.	-5. 8.	-1. 7.
MT:HELENA	2/ 1/82	1.46 0.12	1. 7.	0. 8.	-3. 7.
NC:CHARLOTTE	2/ 1/82	1.48 0.22	6. 15.	-17. 19.	0. 13.
NE:OMAHA	2/12/82	1.22 0.12	7. 7.	1. 8.	3. 7.
NH:MANCHESTER	2/ 1/82	1.35 0.12	0. 7.	-2. 8.	1. 7.
NJ:TRENTON	2/ 4/82	1.38 0.12	4. 7.	-1. 8.	0. 7.
NV:LAS VEGAS	2/ 9/82	1.36 0.12	4. 7.	1. 8.	1. 7.
NY:BUFFALO	2/ 1/82	1.43 0.08	1. 5.	-2. 6.	-1. 5.
NY:NEW YORK CITY	2/ 1/82	1.44 0.12	0. 7.	-4. 8.	4. 7.
NY:SYRACUSE	2/ 1/82	1.41 0.12	4. 7.	-5. 8.	-4. 7.
OH:CINCINNATI	2/ 1/82	1.30 0.12	-2. 7.	-6. 8.	2. 7.
OH:CLEVELAND	2/ 8/82	1.39 0.12	5. 7.	-1. 8.	1. 7.
OK:OKLAHOMA CITY	2/ 1/82	1.36 0.08	2. 5.	-5. 6.	-1. 5.
PA:PHILADELPHIA	2/ 8/82	1.39 0.12	5. 7.	-7. 8.	0. 7.
PA:PITTSBURGH	2/10/82	1.50 0.12	3. 7.	3. 8.	2. 7.
PC:ANCON	2/11/82	1.38 0.12	13. 7.	3. 8.	1. 7.
PR:SAN JUAN	2/11/82	1.38 0.12	3. 7.	-1. 8.	-1. 7.
SC:CHARLESTON	2/18/82	1.38 0.22	11. 15.	-15. 19.	-1. 13.

TABLE 16 (CONTINUED)

CONCENTRATIONS OF RADIONUCLIDES IN PASTEURIZED MILK

FEBRUARY 1982

LOCATION	DATE COLLECTED	K g/l±2s	^{137}Cs pCi/l±2s	^{140}Ba pCi/l±2s	^{131}I pCi/l±2s
SD:RAPID CITY	2/ 4/82	1.38 0.12	-1. 7.	-6. 8.	2. 7.
TN:CHATTANOOGA	2/ 8/82	1.36 0.12	5. 7.	2. 8.	1. 7.
TN:KNOXVILLE	2/ 1/82	1.40 0.12	0. 7.	-3. 8.	-3. 7.
TN:MEMPHIS	2/18/82	1.38 0.12	7. 7.	3. 8.	2. 7.
TX:AUSTIN	2/23/82	1.37 0.12	0. 7.	-3. 8.	3. 7.
TX:AUSTIN	2/ 5/82	1.32 0.12	1. 7.	-4. 8.	1. 7.
UT:SALT LAKE CITY	2/ 1/82	1.45 0.08	4. 5.	2. 6.	0. 5.
VA:NORFOLK	2/ 5/82	1.47 0.08	3. 5.	-5. 6.	1. 5.
VT:BURLINGTON	2/ 4/82	1.42 0.12	1. 7.	-3. 8.	-1. 7.
WA:SEATTLE	2/ 1/82	1.36 0.08	0. 5.	0. 6.	-1. 5.
WI:MILWAUKEE	2/ 1/82	1.40 0.08	5. 5.	-6. 6.	-4. 5.
WV:CHARLESTON	2/22/82	1.29 0.12	0. 7.	-2. 8.	0. 7.
WY:LARAMIE	2/ 2/82	1.36 0.12	1. 7.	-3. 8.	0. 7.

s SIGMA COUNTING ERROR

TABLE 17

CONCENTRATIONS OF RADIONUCLIDES IN PASTEURIZED MILK

MARCH 1982

LOCATION	DATE COLLECTED	K g/l±2s	^{137}Cs pCi/l±2s	^{140}Ba pCi/l±2s	^{131}I pCi/l±2s
AL:MONTGOMERY	3/ 4/82	1.34 0.12	5. 7.	-9. 8.	2. 7.
AR:LITTLE ROCK	3/ 1/82	1.39 0.12	9. 7.	0. 8.	-2. 7.
AZ:PHOENIX	3/10/82	1.31 0.12	2. 7.	-1. 8.	-1. 7.
CA:LOS ANGELES	3/ 2/82	1.35 0.12	2. 7.	-5. 8.	0. 7.
CA:SACRAMENTO	3/ 3/82	1.41 0.12	8. 7.	-2. 8.	4. 7.
CA:SAN FRANCISCO	3/ 3/82	1.36 0.12	3. 7.	-2. 8.	5. 7.
CO:DENVER	3/30/82	1.43 0.12	4. 7.	3. 8.	-1. 7.
CT:HARTFORD	3/ 1/82	1.44 0.12	9. 7.	0. 8.	4. 7.
DC:WASHINGTON	3/ 5/82	1.37 0.08	5. 5.	-2. 6.	1. 5.
DE:WILMINGTON	3/ 1/82	1.36 0.12	5. 7.	3. 8.	0. 7.
FL:TAMPA	3/ 1/82	1.41 0.08	19. 5.	1. 6.	-2. 5.
GA:ATLANTA	3/ 1/82	1.35 0.12	4. 7.	-4. 8.	4. 7.
GA:ATLANTA	3/10/82	1.42 0.12	3. 7.	6. 8.	-10. 7.
HI:HONOLULU	3/ 2/82	1.30 0.08	7. 5.	-2. 6.	4. 5.
IA:DES MOINES	3/ 1/82	1.34 0.12	2. 7.	5. 8.	1. 7.
ID:IDAHO FALLS	3/ 3/82	1.44 0.16	0. 11.	-5. 13.	4. 9.
IL:CHICAGO	3/ 1/82	1.43 0.08	4. 5.	-3. 6.	-2. 5.
IN:INDIANAPOLIS	3/ 8/82	1.37 0.12	4. 7.	0. 8.	-3. 7.
KS:WICHITA	3/ 8/82	1.38 0.08	7. 5.	-3. 6.	2. 5.
KY:LOUISVILLE	3/ 2/82	1.40 0.12	4. 7.	7. 8.	-2. 7.
LA:NEW ORLEANS	3/29/82	1.42 0.08	3. 5.	0. 6.	0. 5.
MA:BOSTON	3/ 9/82	1.38 0.12	3. 7.	7. 8.	4. 7.
MD:BALTIMORE	3/ 5/82	1.53 0.12	9. 7.	-4. 8.	4. 7.
ME:PORTLAND	3/ 8/82	1.37 0.12	9. 7.	2. 8.	1. 7.
MI:DETROIT	3/10/82	1.42 0.08	9. 5.	-3. 6.	5. 5.
MI:GRAND RAPIDS	3/10/82	1.37 0.12	-1. 7.	1. 8.	-5. 7.
MN:MINN./ST. PAUL	3/ 1/82	1.39 0.12	5. 7.	-3. 8.	2. 7.
MO:KANSAS CITY	3/11/82	1.38 0.12	2. 7.	-3. 8.	-3. 7.
MO:ST. LOUIS	3/ 3/82	1.33 0.08	2. 5.	-1. 6.	2. 5.
MS:JACKSON	3/ 8/82	1.30 0.12	1. 7.	2. 8.	3. 7.
MT:HELENA	3/ 1/82	1.43 0.12	3. 7.	-4. 8.	-4. 7.
NC:CHARLOTTE	3/ 1/82	1.29 0.22	0. 15.	-3. 19.	1. 13.
NE:OMAHA	3/12/82	1.23 0.12	2. 7.	1. 8.	-3. 7.
NH:MANCHESTER	3/ 1/82	1.33 0.12	4. 7.	1. 8.	0. 7.
NJ:TRENTON	3/ 4/82	1.38 0.12	-1. 7.	-7. 8.	4. 7.
NJ:TRENTON	3/25/82	1.36 0.12	3. 7.	-3. 8.	1. 7.
NV:LAS VEGAS	3/10/82	1.45 0.12	7. 7.	-4. 8.	0. 7.
NY:BUFFALO	3/ 2/82	1.45 0.12	5. 7.	2. 8.	2. 7.
NY:SYRACUSE	3/ 1/82	1.44 0.12	1. 7.	-1. 8.	1. 7.
OH:CINCINNATI	3/ 1/82	1.34 0.12	0. 7.	-1. 8.	0. 7.
OH:CLEVELAND	3/ 8/82	1.39 0.12	4. 7.	-6. 8.	2. 7.
OK:OKLAHOMA CITY	3/29/82	1.42 0.12	0. 7.	-8. 8.	0. 7.
OK:OKLAHOMA CITY	3/ 1/82	1.38 0.12	6. 7.	3. 8.	1. 7.
OR:PORTLAND	3/ 1/82	1.30 0.12	5. 7.	1. 8.	-1. 7.

TABLE 17 (CONTINUED)

CONCENTRATIONS OF RADIONUCLIDES IN PASTEURIZED MILK

MARCH 1982

LOCATION	DATE COLLECTED	K g/l±2s	^{137}Cs pCi/l±2s	^{140}Ba pCi/l±2s	^{131}I pCi/l±2s
PA:PHILADELPHIA	3/ 8/82	1.36 0.12	2. 7.	-5. 8.	1. 7.
PA:PITTSBURGH	3/10/82	1.43 0.12	0. 7.	1. 8.	-1. 7.
PR:SAN JUAN	3/11/82	1.30 0.12	2. 7.	7. 8.	-5. 7.
SC:CHARLESTON	3/25/82	1.35 0.22	4. 15.	-23. 19.	-3. 13.
SD:RAPID CITY	3/ 4/82	1.46 0.12	3. 7.	-5. 8.	2. 7.
TN:CHATTANOOGA	3/ 8/82	1.30 0.12	1. 7.	-6. 8.	1. 7.
TN:KNOXVILLE	3/ 1/82	1.38 0.12	9. 7.	6. 8.	3. 7.
TN:MEMPHIS	3/11/82	1.48 0.12	2. 7.	-4. 8.	-1. 7.
UT:SALT LAKE CITY	3/ 2/82	1.37 0.12	5. 7.	0. 8.	3. 7.
VA:NORFOLK	3/ 5/82	1.54 0.12	6. 7.	-1. 8.	4. 7.
VT:BURLINGTON	3/ 1/82	1.39 0.08	5. 5.	5. 6.	-2. 5.
WA:SEATTLE	3/ 1/82	1.31 0.12	5. 7.	3. 8.	6. 7.
WI:MILWAUKEE	3/ 3/82	1.43 0.12	-1. 7.	-6. 8.	2. 7.
WI:MILWAUKEE	3/31/82	1.49 0.12	6. 7.	0. 8.	7. 7.
WY:LARAMIE	3/ 2/82	1.35 0.08	5. 5.	0. 6.	-2. 5.

s SIGMA COUNTING ERROR

TABLE 18

STRONTIUM-90 AND STRONTIUM-89 IN PASTEURIZED MILK

EPA REGIONAL COMPOSITES

JANUARY - MARCH 1982

EPA REGION	^{90}Sr pCi/l $\pm$ 2s	^{89}Sr pCi/l $\pm$ 2s*
I	3.2 1.4	0. 0.
II	3.5 1.2	0. 0.
III	3.2 1.0	1. 0.
IV	2.8 1.0	0. 0.
V	2.8 1.0	1. 0.
VI	3.4 1.2	0. 0.
VII	3.5 1.3	0. 0.
VIII	1.9 0.9	1. 0.
IX	0.6 0.4	1. 1.
X	2.0 0.9	1. 0.

s SIGMA COUNTING ERROR
s* ANALYTICAL ERROR TERM WHICH CLOSELY APPROXIMATES THE COUNTING ERROR

Carbon-14 in Milk

Nine stations, chosen for wide geographical distribution, contribute milk samples for annual analysis for carbon-14. These samples have monitored the carbon-14 levels in the food chain resulting from nuclear testing.

Analysis consists of combusting the samples and measuring released carbon dioxide through liquid scintillation.

The results of carbon-14 analysis on samples collected during May 1975 and May 1979 are reported in Tables 19 and 20 respectively.

TABLE 19

Carbon-14 in Milk

May 1975

Location	Date Sample Collected	dpm/g C ± 2 Sigma Counting Error	pCi/l ± 2 Sigma Counting Error
LA:New Orleans	5/75	17.62±0.5	474±13
MA:Boston	5/75	18.02±0.5	485±13
HI:Honolulu	5/75	17.63±0.6	474±16
CA:Los Angeles	5/75	17.97±0.5	483±13
OR:Portland	5/75	17.61±0.6	474±16
ID:Idaho Falls	5/75	21.18±0.7	570±19
SC:Charleston	5/75	19.29±0.6	519±13
IL:Chicago	5/75	21.23±0.7	571±19
AK:Anchorage	5/75	NS	

TABLE 20

Carbon-14 in Milk

May 1979

Location	Date Sample Collected	dpm/g C ± 2 Sigma Counting Error	pCi/l ± 2 Sigma Counting Error
LA:New Orleans	5/79	16.63±1.7	493±16
MA:Boston	5/79	16.54±1.0	445±28
HI:Honolulu	5/79	18.23±1.4	490±38
CA:Los Angeles	5/79	17.79±1.4	479±38
OR:Portland	5/79	16.65±1.3	448±34
ID:Idaho Falls	5/79	17.39±1.3	468±34
SC:Charleston	5/79	16.78±1.4	451±37
IL:Chicago	5/79	16.47±1.2	443±31
AK:Anchorage	5/79	15.28±1.2	411±32

Radiological Health Laboratory
Indiana State Board of Health

Indiana Milk Analysis Program

In order to evaluate the fallout on Indiana pasturelands, the State has implemented a program whereby monthly milk samples from five geographical areas are sent to the Radiological Health Laboratory of the State Board of Health. The milk in these samples is bottled on the same date in all five areas to provide uniform time from pasture to the lab.

Once in the laboratory, the milk is first analyzed by gamma spectroscopy for iodine-131, barium-140, cesium-137, and potassium-40. A one gallon sample is analyzed on a 3" x 3" NaI(Tl) scintillation crystal for 4800 seconds. A background sample of 48,000 seconds is also run. The data are analyzed to give pCi/l for each radionuclide.

A quarterly composite sample is saved and run for strontium-89 and -90 by ion exchange method.

Data for the first and second quarters of 1982 are shown in Tables 21 - 22.

TABLE 21

INDIANA MILK ANALYSIS PROGRAM

(First and Second Quarters of 1982)

Concentrations of Selected Gamma Radionuclides in Pasteurized Milk

	Location	Date	pCi/l I-131	pCi/l Ba-140	pCi/l Cs-137	g/l K
IN:	Evansville	1/82	0 ± 5	0 ± 5	2 ± 5	1.69 ± 0.12
	Fort Wayne	1/82	6 ± 5	1 ± 5	13 ± 5	1.74 ± 0.12
	Indianapolis	1/82	3 ± 5	0 ± 5	15 ± 5	1.70 ± 0.12
	Rochester	1/82	0 ± 5	0 ± 5	9 ± 5	1.63 ± 0.12
	Seymour	1/82	0 ± 5	0 ± 5	4 ± 5	1.61 ± 0.12
IN:	Evansville	2/82	0 ± 5	0 ± 5	3 ± 5	1.62 ± 0.12
	Fort Wayne	2/82	6 ± 5	0 ± 5	14 ± 5	1.58 ± 0.12
	Indianapolis	2/82	4 ± 5	0 ± 5	0 ± 5	1.55 ± 0.12
	Rochester	2/82	0 ± 5	5 ± 5	1 ± 5	1.53 ± 0.12
	Seymour	2/82	1 ± 5	6 ± 5	0 ± 5	1.54 ± 0.12
IN:	Evansville	3/82	3 ± 5	0 ± 5	10 ± 5	1.51 ± 0.12
	Fort Wayne	3/82	0 ± 5	0 ± 5	4 ± 5	1.58 ± 0.12
	Indianapolis	3/82	1 ± 5	0 ± 5	4 ± 5	1.63 ± 0.12
	Rochester	3/82	0 ± 5	7 ± 5	1 ± 5	1.48 ± 0.12
	Seymour	3/82	0 ± 5	2 ± 5	7 ± 5	1.51 ± 0.12
IN:	Evansville	4/82	2 ± 5	0 ± 5	0 ± 5	1.57 ± 0.12
	Fort Wayne	4/82	0 ± 5	0 ± 5	1 ± 5	1.47 ± 0.12
	Indianapolis	4/82	0 ± 5	0 ± 5	1 ± 5	1.57 ± 0.12
	Rochester	4/82	4 ± 5	6 ± 5	1 ± 5	1.62 ± 0.12
	Seymour	4/82	0 ± 5	3 ± 5	5 ± 5	1.53 ± 0.12
IN:	Evansville	5/82	-3 ± 5	0 ± 5	5 ± 5	1.54 ± 0.12
	Fort Wayne	5/82	0 ± 5	-3 ± 5	5 ± 5	1.58 ± 0.12
	Indianapolis	5/82	0 ± 5	2 ± 5	4 ± 5	1.53 ± 0.12
	Rochester	5/82	0 ± 5	1 ± 5	8 ± 5	1.56 ± 0.12
*	Seymour	5/82	--	--	--	--
IN:	Evansville	6/82	9 ± 5	-7 ± 5	12 ± 5	1.76 ± 0.12
	Fort Wayne	6/82	1 ± 5	1 ± 5	5 ± 5	1.58 ± 0.12
	Indianapolis	6/82	13 ± 5	3 ± 5	29 ± 7	1.79 ± 0.12
	Rochester	6/82	7 ± 5	-2 ± 5	15 ± 5	1.71 ± 0.12
	Seymour	6/82	3 ± 5	-1 ± 5	2 ± 5	1.70 ± 0.12

*Denotes sample not taken.

TABLE 22

Concentrations of ^{89}Sr and ^{90}Sr in Pasteurized Milk

(pCi/l ± 2 Sigma Counting Error)

	Location	Date	^{89}Sr	^{90}Sr
IN:	Evansville	1/82	0 ± 0.3	4 ± 0.7
	Fort Wayne	1/82	1 ± 0.5	4 ± 0.7
	Indianapolis	1/82	0 ± 0.3	4 ± 0.7
	Rochester	1/82	-3 ± 0.6	6 ± 0.9
	Seymour	1/82	-2 ± 0.5	5 ± 0.8
IN:	Evansville	2/82	6 ± 0.9	3 ± 0.6
	Fort Wayne	2/82	4 ± 0.7	3 ± 0.6
	Indianapolis	2/82	3 ± 0.6	3 ± 0.6
	Rochester	2/82	-1 ± 0.3	5 ± 0.8
	Seymour	2/82	1 ± 0.3	3 ± 0.6
IN:	Evansville	3/82	3 ± 0.6	4 ± 0.7
	Fort Wayne	3/82	4 ± 0.7	3 ± 0.6
	Indianapolis	3/82	3 ± 0.6	2 ± 0.5
	Rochester	3/82	2 ± 0.5	6 ± 0.9
	Seymour	3/82	5 ± 0.8	4 ± 0.7
IN:	Evansville	4/82	-1 ± 0.3	3 ± 0.6
	Fort Wayne	4/82	-2 ± 0.5	4 ± 0.7
	Indianapolis	4/82	-3 ± 0.6	4 ± 0.7
	Rochester	4/82	-1 ± 0.3	4 ± 0.7
	Seymour	4/82	-3 ± 0.6	5 ± 0.8
IN:	Evansville	5/82	-1 ± 0.5	4 ± 0.7
	Fort Wayne	5/82	2 ± 0.5	2 ± 0.5
*	Indianapolis	5/82	12 ± 1.6	3 ± 0.6
*	Rochester	5/82	13 ± 1.8	2 ± 0.5
*	Seymour	5/82	8 ± 1.1	3 ± 0.6
IN:	Evansville	6/82	-4 ± 0.7	6 ± 0.9
	Fort Wayne	6/82	0 ± 0.3	4 ± 0.7
	Indianapolis	6/82	1 ± 0.5	4 ± 0.7
	Rochester	6/82	2 ± 0.5	5 ± 0.8
	Seymour	6/82	3 ± 0.6	3 ± 0.6

*Denotes 3 columns were contaminated by previous testing of EPA collaborative sample.

Radiological Health Division
State Hygienic Laboratory of Iowa

Iowa Water Sampling Program

The radiological Health Division of the State Hygienic Laboratory of Iowa with the assistance of the State Department of Environmental Quality (DEQ) maintains a state-wide water sampling program of community drinking waters, surface waters and precipitation. All analyses with the exception of the sequential Ra-226, -228 analyses are performed according to "Standard Methods for the Examination of Water and Wastewater", 14th edition. The sequential analyses for radiums are performed according to the EPA publication, EPA-600/4-75-008, "Interim Radiochemical Methodology for Drinking Water."

The drinking water samples are collected by DEQ regional personnel and sent to the State Hygienic Laboratory where they are preserved with HCl. These waters are analyzed for gross alpha and gross beta radioactivity as a screening process. Subsequent analyses for Ra-226, Ra-228, Sr-90 are performed if screening levels are exceeded. Radium levels are of primary concern in Iowa drinking waters as those levels are elevated in deep geologic aquifers within the state.

Surface waters are collected at eleven sites throughout the state with site selection being determined by proximity upstream and downstream to nuclear power plants in Iowa or those plants discharging into rivers which are natural borders with adjoining states. Gross alpha, gross beta, and tritium are the routine radionuclide analyses for these samples. Strontium is of interest when gross beta screening levels are exceeded or if nuclear weapons testing necessitates monitoring to determine its impact on the environment.

Background Radiation Levels, Tritium, for the second quarter, 1981, are shown in Table 23.

Gross Radiation in Precipitation for the second quarter, 1981, is shown in Table 24.

Gross Activity in Surface Water reported as pCi/l for the second quarter, 1981, is shown in Table 25.

Gross Beta Activity in Air for the second quarter, 1981 is shown in Table 26.

SDWA (Safe Drinking Water Act) analyses for April, May and June, 1981, are shown in Tables 27, 28, and 29 respectively.

SDWA Radiological analyses, second quarter recheck samples, for 1981 are shown in Table 30.

Background Radiation Levels, Tritium, second quarter, 1981, are shown in Table 31.

DEQ Mineral Samples for April, May, and June 1981, are shown in

Tables 32, 33, and 34 respectively.

The concentrations of Sr-90 in Iowa Milk Samples are shown in Table 35.

TABLE 23

UNIVERSITY HYGIENIC LABORATORY
STATEWIDE DYNAMIC SURFACE WATER REPORT
Background Radiation Levels, Tritium

Data for 2nd Quarter 1981

IOWA CITY PRECIPITATION

Date Collected	Date Counted	^{3}H Activity, nCi/l
04-06-81	07-16-81	<1.18
04-09-81	07-16-81	<1.18
04-13-81	07-16-81	<1.18
04-14-81	07-16-81	<1.18
04-23-81	07-16-81	<1.18
04-29-81	07-16-81	<1.18
05-05-81	07-16-81	<1.18
05-14-81	07-16-81	<1.18
05-26-81	07-16-81	<1.18
06-24-81	07-16-81	<1.18
06-30-81	07-16-81	<1.18

TABLE 24

UNIVERSITY HYGIENIC LABORATORY
IOWA CITY, IOWA
IOWA CITY PRECIPITATION
GROSS RADIATION

Data for April, May, June 1981

RADIATION #	DATE SAMPLED	AMOUNT PRECIPITATION mm	WATER COLLECTED l	ACTIVITY IN pCi/l	
				ALPHA (DS)	BETA-GAMMA (DS)
18034	04-06-81	17.3	2.6	0.3	41
18036	04-09-81	10.0	1.5	0.1	26
18052	04-13-81	33.3	5.0	0.3	32
18057	04-14-81	5.7	0.8	0.2	17
18083	04-23-81	10.0	1.5	<0.1	13
18117	04-29-81	13.3	2.0	0.1	38
18154	05-05-81	5.7	0.8	0.2	41
18195	05-14-81	3.3	0.5	0.2	107
18226	05-26-81	15.3	2.3	0.2	57
18342	06-24-81	62.0	9.3	0.1	11
18353	06-30-81	39.3	5.9	0.1	10
		Highest		0.3	107
		Lowest		<0.1	10
		Average of 11		0.2	36

TABLE 25

UNIVERSITY HYGIENIC LABORATORY
IOWA CITY, IOWA
RADIOLOGICAL SURFACE WATER SURVEILLANCE
GROSS ACTIVITY REPORTED AS pCi/l

Data for April, May, June 1981

RADIATION #	DATE SAMPLED	ALPHA ACTIVITY TS	DS	SS	BETA-GAMMA ACTIVITY TS	DS	SS
		SKUNK RIVER AT AMES					
18043	04-09-81	10.4	2.2	8.2	8	6	2
18062	04-16-81	2.0	1.6	0.4	11	8	3
18157	04-30-81	7.7	1.8	5.9	2	1	1
18196	05-14-81	1.5	0.7	0.8	12	12	Nil
18213	05-21-81	2.7	2.4	0.3	5	3	2
18331	06-18-81	3.2	2.5	0.7	11	9	2
18346	06-25-81	0.5	0.5	Nil	4	4	Nil
	Average of 7	4.0	1.7	2.3	8	6	2
		CEDAR RIVER AT CEDAR RAPIDS					
18041	04-08-81	0.9	0.8	0.1	6	6	Nil
18078	04-14-81	0.1	0.1	Nil	4	4	Nil
18084	04-21-81	1.3	1.2	0.1	4	4	Nil
18119	04-28-81	0.7	0.7	Nil	5	5	Nil
18180	05-05-81	0.7	0.7	Nil	6	6	Nil
18200	05-12-81	0.9	0.8	0.1	6	5	1
18212	05-19-81	1.0	0.8	0.2	3	3	Nil
18261	05-26-81	1.2	1.2	Nil	4	4	Nil
18270	06-02-81	1.0	0.9	0.1	5	4	1
18296	06-09-81	2.2	1.5	0.7	13	10	3
18306	06-16-81	1.8	1.0	0.8	6	3	3
18349	06-23-81	0.8	0.6	0.2	5	5	Nil
18363	06-30-81	1.4	0.9	0.5	5	4	1
	Average of 13	1.1	0.9	0.2	6	5	1

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TABLE 25 (CONTINUED)

UNIVERSITY HYGIENIC LABORATORY
IOWA CITY, IOWA
RADIOLOGICAL SURFACE WATER SURVEILLANCE
GROSS ACTIVITY REPORTED AS pCi/l

Data for April, May, June 1981

RADIATION	DATE SAMPLED	ALPHA ACTIVITY TS	DS	SS	BETA-GAMMA ACTIVITY TS	DS	SS
		MISSOURI RIVER AT COUNCIL BLUFFS					
18042	04-06-81	1.9	1.5	0.4	5	5	Nil
18060	04-13-81	3.6	3.2	0.4	10	10	<0.5
18080	04-20-81	2.0	1.9	0.1	15	12	3
18118	04-27-81	1.9	1.1	0.8	7	5	2
18168	05-05-81	2.2	2.0	0.2	11	6	5
18193	05-11-81	2.0	1.7	0.3	6	6	Nil
18210	05-18-81	2.1	1.5	0.6	4	4	Nil
18259	06-01-81	1.0	0.7	0.3	6	6	Nil
18268	05-27-81	1.6	1.4	0.2	10	7	3
18297	06-08-81	2.7	1.6	1.1	7	7	Nil
18333	06-15-81	3.3	2.0	1.3	7	7	Nil
18344	06-22-81	1.9	1.3	0.6	15	9	6
18364	06-29-81	4.6	2.6	2.0	3	3	Nil
	Average of 13	2.4	1.7	0.7	8	7	1
		MISSISSIPPI RIVER AT DAVENPORT					
18053	04-10-81	0.6	0.6	Nil	6	4	2
18059	04-15-81	0.1	0.1	Nil	3	3	Nil
18082	04-22-81	1.0	0.4	0.6	5	4	1
18166	04-30-81	0.3	0.2	0.1	6	5	1
18187	05-07-81	0.3	0.3	Nil	4	4	Nil
18194	05-12-81	0.7	0.6	0.1	5	5	Nil
18214	05-21-81	0.5	0.3	0.2	16	3	13
18234	05-28-81	0.5	0.4	0.1	5	4	1
18271	06-04-81	0.3	0.3	Nil	4	3	1
18295	06-10-81	0.5	0.3	0.2	4	3	1
18305	06-17-81	0.4	0.2	0.2	5	3	2
18345	06-24-81	4.4	1.6	2.8	20	6	14
	Average of 12	0.8	0.4	0.4	7	4	3

TABLE 25 (CONTINUED)

UNIVERSITY HYGIENIC LABORATORY
IOWA CITY, IOWA
RADIOLOGICAL SURFACE WATER SURVEILLANCE
GROSS ACTIVITY REPORTED AS pCi/l

Data for April, May, June 1981

RADIATION #	DATE SAMPLED	ALPHA ACTIVITY TS	ALPHA ACTIVITY DS	ALPHA ACTIVITY SS	BETA-GAMMA ACTIVITY TS	BETA-GAMMA ACTIVITY DS	BETA-GAMMA ACTIVITY SS
		DES MOINES RIVER AT DES MOINES					
18173	05-06-81	3.6	2.1	1.5	5	5	Nil
	Average of 1	3.6	2.1	1.5	5	5	Nil
		MISSISSIPPI RIVER AT DUBUQUE					
18019	04-03-81	0.1	Nil	0.1	5	3	2
18051	04-09-81	0.2	0.1	0.1	4	4	Nil
18061	04-16-81	0.4	0.4	Nil	7	7	Nil
18113	04-23-81	Nil	Nil	Nil	5	5	Nil
18156	04-30-81	0.6	0.2	0.4	4	4	Nil
18185	05-07-81	0.6	0.6	<0.1	4	4	Nil
18209	05-15-81	0.6	0.2	0.4	4	4	Nil
18225	05-22-81	0.6	0.3	0.3	5	5	Nil
18257	05-29-81	0.3	0.3	Nil	5	4	1
18276	06-04-81	0.4	0.3	0.1	6	3	3
[illegible]	06-18-81	0.8	0.4	0.4	5	4	1
[illegible]	06-26-81	0.8	0.6	0.2	4	4	Nil
	Average of 12	0.5	0.3	0.2	5	4	1
		NISHNABOTNA RIVER AT HAMBURG					
18035	04-06-81	2.1	2.1	Nil	10	8	2
18233	05-26-81	0.7	0.2	0.5	8	7	1
18343	06-22-81	2.7	2.3	0.4	10	9	1
	Average of 3	1.8	1.5	0.3	9	8	1
		IOWA RIVER AT IOWA CITY					
17981	04-02-81	0.5	0.4	0.1	8	8	Nil
18167	05-06-81	2.0	1.7	0.3	6	6	Nil
18262	06-01-81	0.7	0.5	0.2	4	4	Nil
	Average of 3	1.1	0.9	0.2	6	6	Nil

TABLE 25 (CONTINUED)

UNIVERSITY HYGIENIC LABORATORY
IOWA CITY, IOWA
RADIOLOGICAL SURFACE WATER SURVEILLANCE
GROSS ACTIVITY REPORTED AS pCi/l

Data for April, May, June 1981

RADIATION #	DATE SAMPLED	ALPHA ACTIVITY TS	ALPHA ACTIVITY DS	ALPHA ACTIVITY SS	BETA-GAMMA ACTIVITY TS	BETA-GAMMA ACTIVITY DS	BETA-GAMMA ACTIVITY SS
		MISSISSIPPI RIVER AT LANSING					
18022	04-06-81	0.4	0.2	0.2	9	6	3
18054	04-13-81	0.4	0.2	0.2	4	4	Nil
18081	04-20-81	0.2	0.2	Nil	5	5	Nil
18115	04-27-81	0.8	0.4	0.4	6	5	1
18159	05-04-81	0.3	0.2	0.1	5	4	1
18191	05-11-81	0.5	0.5	Nil	2	2	Nil
18211	05-18-81	0.3	0.2	0.1	4	3	1
18258	06-01-81	0.5	0.2	0.3	3	2	1
18289	06-09-81	1.3	1.2	0.1	3	3	Nil
18303	06-15-81	0.5	0.5	Nil	3	3	Nil
18341	06-22-81	0.6	0.4	0.2	2	1	1
18354	06-29-81	1.3	1.2	0.1	7	7	Nil
	Average of 12	0.6	0.6	0.1	4	4	Nil
		MISSOURI RIVER AT SIOUX CITY					
18021	04-06-81	1.9	1.8	0.1	8	8	Nil
18055	04-13-81	2.5	2.4	0.1	3	3	Nil
18077	04-20-81	2.4	1.7	0.7	9	9	Nil
18116	04-28-81	1.9	1.9	Nil	9	8	1
18165	05-04-81	2.5	1.9	0.6	14	12	2
18192	05-11-81	1.0	0.9	0.1	4	3	1
18224	05-18-81	2.5	1.9	0.6	7	7	Nil
18230	05-26-81	2.2	2.0	0.2	8	7	1
18269	06-01-81	1.4	1.0	0.4	4	3	1
18290	06-08-81	5.2	3.3	1.9	6	5	1
18362	06-30-81	1.6	1.3	0.3	5	5	Nil
	Average of 11	2.1	1.7	0.4	7	6	1

TABLE 25 (CONTINUED)

UNIVERSITY HYGIENIC LABORATORY
IOWA CITY, IOWA
RADIOLOGICAL SURFACE WATER SURVEILLANCE
GROSS ACTIVITY REPORTED AS pCi/l

Data for April, May, June 1981

RADIATION #	DATE SAMPLED	ALPHA ACTIVITY TS	DS	SS	BETA-GAMMA ACTIVITY TS	DS	SS
		CEDAR RIVER AT VINTON.					
18020	04-06-81	0.6	0.5	0.1	5	5	Nil
18055	04-13-81	1.3	1.3	Nil	7	7	Nil
18079	04-20-81	1.0	1.0	Nil	5	5	Nil
18114	04-27-81	0.7	0.6	0.1	4	4	Nil
18158	05-04-81	0.5	0.5	Nil	7	6	1
18229	05-26-81	1.1	0.6	0.5	3	3	Nil
18260	06-01-81	0.7	0.6	0.1	6	6	Nil
18277	06-08-81	0.9	0.7	0.2	3	3	Nil
18304	06-15-81	0.9	0.8	0.1	5	3	2
18340	06-22-81	0.8	0.8	<0.1	4	3	1
18355	06-29-81	1.0	0.7	0.3	5	5	Nil
	Average of 11	0.9	0.7	0.2	5	5	Nil

TABLE 26

UNIVERSITY HYGIENIC LABORATORY
IOWA CITY, IOWA
RADIOLOGICAL ANALYSIS
GROSS BETA ACTIVITY IN AIR
2ND QUARTER 1981

April, May, June 1981

SAMPLE #	DATE SAMPLED	AIR VOLUME m^3	pCi/m^3
	AMES		
1015535	04-04-81	1758.2	0.08
1015977	04-10-81	1761.9	0.14
1015978	04-16-81	1815.4	0.18
1015981	05-04-81	1809.9	0.19
1016192	05-10-81	1855.2	0.22
1016193	05-16-81	1837.7	0.36
1016194	05-22-81	1801.9	0.36
1016195	05-28-81	1810.7	0.20
1016196	06-03-81	1694.8	0.22
1016505	06-09-81	1672.1	0.18
1016506	06-16-81	1768.8	0.16
1016507	06-21-81	1846.5	0.14
		Average of 12	0.20
	COUNCIL BLUFFS		
1015495	04-10-81	1730.9	0.30
1015932	04-16-81	1807.0	0.23
1015936	04-22-81	1699.1	0.20
1015940	04-28-81	1650.0	0.23
1015927	05-04-81	1683.6	0.20
1015931	05-10-81	1743.2	0.40
1016223	05-16-81	1697.3	0.40
1016227	05-22-81	1657.7	0.33
1016231	05-28-81	1699.3	0.17
1016235	06-03-81	1690.2	0.24
1016243	06-09-81	1582.6	0.22
1016538	06-15-81	1647.0	0.15
1016537	06-21-81	1649.4	0.19
1016533	06-27-81	1596.0	0.13
		Average of 14	0.24
	DUBUQUE		
1015601	04-04-81	1754.0	0.17
1015602	04-10-81	1631.5	0.19
1015604	04-16-81	1728.0	0.26
1015605	04-22-81	1644.4	0.23
1015606	04-28-81	1686.3	0.21
1016048	05-04-81	1734.5	0.43
1016049	05-10-81	1797.7	0.23
1016050	05-16-81	1730.6	0.36
1016051	05-22-81	1907.2	0.40
1016052	05-28-81	1400.2	0.16
1016318	06-03-81	1677.6	0.27
1016319	06-09-81	1682.5	0.21
1016320	06-15-81	1702.6	0.10
1016321	06-21-81	1632.4	0.12
1016324	06-27-81	1665.7	0.19
		Average of 15	0.24

UNIVERSITY HYGIENIC LABORATORY
IOWA CITY, IOWA
RADIOLOGICAL ANALYSIS
GROSS BETA ACTIVITY IN AIR
2ND QUARTER 1981

April, May, June 1981

SAMPLE #	DATE SAMPLED	AIR VOLUME m^3	pCi/m^3
		MASON CITY	
1015795	04-04-81	1693.9	0.04
1016068	04-10-81	1724.6	0.25
1016064	04-16-81	1733.7	0.02
1016056	04-22-81	1721.0	0.12
1015994	04-28-81	1924.6	0.22
1016401	05-04-81	1716.4	0.12
1016397	05-10-81	1837.9	0.18
1016391	05-16-81	1886.7	0.35
1016393	05-22-81	1709.3	0.35
1016385	05-28-81	1827.6	0.09
1353613	06-03-81	1791.6	0.23
1353609	06-09-81	1796.9	0.19
1353605	06-15-81	1871.3	0.12
1016060	06-21-81	1792.7	0.11
1015664	06-27-81	1788.5	0.16
		Average of 15	0.17
		OTTUMWA	
1014838	04-04-81	1725.0	0.13
1014839	04-10-81	1783.4	0.19
1014840	04-16-81	1769.5	0.23
1014841	04-22-81	1712.0	0.18
1016084	04-29-81	1786.9	0.31
1016085	05-04-81	1783.3	0.28
1016086	05-10-81	1814.6	0.17
1016087	05-16-81	1828.9	0.38
1016088	05-22-81	1820.6	0.14
1016417	05-29-81	1809.4	0.17
1016418	06-03-81	1730.2	0.23
1016419	06-09-81	1722.1	0.20
1016420	06-15-81	1688.8	0.12
1016421	06-21-81	1733.3	0.11
1013629	06-27-81	1774.2	0.34
		Average of 15	0.21

TABLE 26 (CONTINUED)

UNIVERSITY HYGIENIC LABORATORY
IOWA CITY, IOWA
RADIOLOGICAL ANALYSIS
GROSS BETA ACTIVITY IN AIR
2ND QUARTER 1981

April, May, June 1981

SAMPLE #	DATE SAMPLED	AIR VOLUME m^3	pCi/m^3
		DAVENPORT	
1016118	04-04-81	1562.3	0.24
1016101	04-10-81	1557.1	0.20
1016113	04-16-81	1660.9	0.22
1016110	04-22-81	1636.3	0.11
1015463	04-28-81	1630.6	0.22
265625	05-04-81	1636.3	0.22
1016442	05-10-81	1619.3	0.16
1016435	05-28-81	1416.5	0.15
1353663	06-03-81	1455.6	0.21
1353662	06-09-81	1463.4	0.21
1353649	06-15-81	1496.8	0.10
1353653	06-21-81	1539.6	0.12
1353642	06-27-81	1504.6	0.16
		Average of 13	0.18
		WATERLOO	
1014888	04-04-81	1849.9	0.10
1014889	04-10-81	1944.4	0.17
1014891	05-04-81	1774.0	0.27
1014892	05-10-81	1900.0	0.21
1014893	05-16-81	1869.3	0.36
1015887	05-22-81	1843.2	0.33
1015888	05-28-81	1813.7	0.18
1015889	06-03-81	1778.2	0.23
1015891	06-15-81	1772.8	0.11
1015892	06-21-81	1855.9	0.11
1015893	06-27-81	1813.4	0.19
		Average of 11	0.21
		SIOUX CITY	
1015738	04-04-81	1825.3	0.15
1016184	04-10-81	1792.3	0.22
1016177	04-16-81	1842.4	0.15
1016178	04-22-81	1803.0	0.21
1016123	04-28-81	1799.0	0.19
1016121	05-04-81	1801.2	0.23
1016463	05-10-81	1827.7	0.26
1016465	05-16-81	1788.4	0.33
1016453	05-22-81	1773.3	0.27
1353667	06-09-81	1737.9	0.17
1353664	06-15-81	1739.7	0.10
1353677	06-21-81	1735.3	0.16
1353673	06-07-81	1726.0	0.17
		Average of 13	0.20

TABLE 27

UNIVERSITY HYGIENIC LABORATORY
IOWA CITY, IOWA
RADIOLOGICAL ANALYSIS
SDWA SAMPLES

Data for April 1981

TOWN	COUNTY	IDENTIFICATION	RADIATION # OR MINERAL #	DATE SAMPLED	pCi/l			
					ALPHA	BETA	^{226}Ra	^{228}Ra
Gruver	Emmet	Well #1, 240'	R15908	03-24-80 07-10-80 10-23-80 02-05-81	2.1	12	0.3	<0.6
Melvin	Osceola	Well #2, 40'	R15909	04-10-80 08-11-80 12-06-80 03-20-81	1.7	10		
Algona	Kossuth	Well #1, Steve Youngwirth South Oak Estates, Algona 50511	R16001	04-15-80 08-18-80 11-17-80 03-17-81	0.7	5		
Schleswig	Crawford		R16043	05-28-80 08-22-80 11-25-80 03-18-81	1.2	11		
Wapello	Louisa	Well #1	R16069	04-14-80 07-21-80 11-12-80 03-31-81	0.5	8		
Olds	Henry	Well #1, 250'; #2, 275' #3, 1905'	R16261	05-05-80 08-20-80 11-27-80 03-03-81	11	38	6.2	1.5

TABLE 27 (CONTINUED)

UNIVERSITY HYGIENIC LABORATORY
IOWA CITY, IOWA
RADIOLOGICAL ANALYSIS
SDWA SAMPLES

Data for April 1981

TOWN	COUNTY	IDENTIFICATION	RADIATION # OR MINERAL #	DATE SAMPLED	pCi/l			
					ALPHA	BETA	^{226}Ra	^{228}Ra
Lowden	Cedar	Well #1, 1400'	R16272	04-28-80 07-30-80 11-05-80 02-09-81	17	9	2.9	<0.6
Red Oak	Montgomery		R16273	04-28-80 08-21-80 11-18-80 03-20-81	0.3	3		
Dana	Greene	Well #1, 181'	R16278	05-20-80 08-26-80 12-04-80 03-19-81	<0.1	6		
Elkhart	Polk	Well #2, 265'	R16280	04-29-80 08-04-80 11-26-80 03-20-81	1.7	6		
Emmetsburg	Palo Alto	Well #2, 40'	R16322	05-13-80 08-25-80 12-01-80 03-23-81	0.7	15		
Maxwell	Story	Well #1, 180', Jack Schlater Rolling Hills, Lot 132, Maxwell, IA	R16367	05-29-80 09-15-80 12-23-80 03-31-81	0.4	10		

TABLE 27 (CONTINUED)

UNIVERSITY HYGIENIC LABORATORY
IOWA CITY, IOWA
RADIOLOGICAL ANALYSIS
SDWA SAMPLES

Data for April 1981

TOWN	COUNTY	IDENTIFICATION	RADIATION # OR MINERAL #	DATE SAMPLED	pCi/l			
					ALPHA	BETA	^{226}Ra	^{228}Ra
Washington	Washington	Well #1	16027A	04-01-80 08-04-80 10-27-80 01-27-81	3.7	9	0.4	<0.6
Ottumwa	Wapello		R17928	04-02-81	0.4	7		

TABLE 28

UNIVERSITY HYGIENIC LABORATORY
IOWA CITY, IOWA
RADIOLOGICAL ANALYSIS
SDWA SAMPLES

Data for May 1981

TOWN	COUNTY	IDENTIFICATION	MINERAL # OR RADIATION #	DATE SAMPLED	pCi/l			
					ALPHA	BETA	^{226}Ra	^{228}Ra
Moorland	Webster	Well #94-61-000, 728'	15055A	05-15-79 12-05-79 04-11-80 12-16-80	3.9	10	1.7	<0.5
Oyens	Plymouth	Well #1, 240'	15605A	10-22-79 02-14-80 12-08-80 03-31-81	0.7	9		
Dubuque	Dubuque	Well #1, 255'	16289A	06-12-80 09-15-80 12-09-80 03-17-81	0.8	5		
Fort Dodge	Webster	Well #1, 400'	R15871	03-05-80 07-30-80 11-05-80 02-06-81	2.7	3	1.0	<0.5
Wapello	Louisa	Well 96', C. E. Calglazier Woodland Mobile Home Park, R.R. #2, Box 232, Wapello, IA 52653	R15877	03-10-80 08-13-80 12-08-80 03-26-81	1.1	<0.5		
Oxford	Johnson	Well #1, 500', Larry Wilcox Parkview Mobile Home Court, R.R. #2, Oxford, IA 52322	R15996	03-21-80 07-15-80 11-04-80 02-06-81	7.1	19	3.5	<0.5

TABLE 28 (CONTINUED)

UNIVERSITY HYGIENIC LABORATORY
IOWA CITY, IOWA
RADIOLOGICAL ANALYSIS
SDWA SAMPLES

Data for May 1981

TOWN	COUNTY	IDENTIFICATION	RADIATION #	DATE SAMPLED	pCi/l			
					ALPHA	BETA	^{226}Ra	^{228}Ra
Sidney	Fremont	Well 80', Lyle Fulk, Fremont County Care Facility, R.R. #1, Box 152, Sidney, IA 51652	R15998	03-25-80 06-24-80 10-22-80	2.5	6	0.2	1.4
Marshalltown	Marshall	Well #1, 85', Timber Valley Mobile Home Park, R.R. #4, Marshalltown, IA 50158	R15999	05-13-80 08-31-80 01-03-81 04-08-81	0.4	5		
Independence	Buchanan	Ray See, Pine Ridge Mobile Home Park, R.R. #2, Independence, IA 50644	R16064	04-07-80 07-28-80 11-17-80 03-23-81	0.8	5		
Ottoser	Humboldt		R16116	05-28-80 08-27-80 12-29-80 04-21-81	<0.3	6		
Boone	Boone		R16257	04-25-80 07-28-80 10-27-80 02-03-81	8.8	4	0.1	1.5
Underwood	Pottawattamie		R16259	05-01-80 08-13-80 11-24-80 03-17-81	2.0	4	0.2	1.2

TABLE 28 (CONTINUED)

UNIVERSITY HYGIENIC LABORATORY
IOWA CITY, IOWA
RADIOLOGICAL ANALYSIS
SDWA SAMPLES

Data for May 1981

TOWN	COUNTY	IDENTIFICATION	RADIATION #	DATE SAMPLED	pCi/l			
					ALPHA	BETA	^{226}Ra	^{228}Ra
Alta	Buena Vista	Well #4, 520'	R16263	05-07-80 10-15-80 01-22-81 04-22-81	1.4	7		
Ridgeway	Winneshiek	Well #1, 570'	R16266	05-19-80 09-03-80 12-08-80 03-23-81	1.5	3		
Castana	Monona	Well #1, 58'	R16267	05-13-80 08-28-80 11-26-80 03-16-81	2.2	7	0.3	<0.6
Armstrong	Emmet	Well #4, 134'	R16270	04-29-80 08-12-80 12-08-80 03-23-81	0.3	10		
New Hampton	Chickasaw	Well #East, 1325'	R16312	05-07-80 08-06-80 11-05-80 02-05-81	7.5		2.0	1.7
Missouri Valley	Harrison		R16313	05-19-80 10-01-80 01-21-81 04-21-81	1.4	2		

TABLE 28 (CONTINUED)

UNIVERSITY HYGIENIC LABORATORY
IOWA CITY, IOWA
RADIOLOGICAL ANALYSIS
SDWA SAMPLES

Data for May 1981

TOWN	COUNTY	IDENTIFICATION	RADIATION #	DATE SAMPLED	pCi/l ALPHA	BETA	^{226}Ra	^{228}Ra
Janesville	Bremer	Well #1, 56', Don Westmeyer Riverview Mobile Home Court, 315 Maple Street, Janesville, IA 50647	R16316	05-13-80 10-15-80 05-04-81	0.8	5		
Elliott	Montgomery	Well #1, 106'	R16320	05-12-80 08-12-80 11-18-80 04-20-81	0.6	4		
Gillett Grove	Clay	Well #1, 40'	R16323	05-12-80 08-25-80 12-08-80 04-02-81	1.1	7		
Renwick	Humboldt	Well #2, 226'	R16365	05-12-80 08-18-80 11-17-80 03-03-81	2.8	4	0.2	1.0
Blencoe	Monona	Well #1, 100'	R16370	05-19-80 09-17-80 12-22-80 04-13-81	0.4	14		
Defiance	Shelby	Well #5, 50'	R16371	06-16-80 09-30-80 01-14-81 04-15-81	1.1	7		

TABLE 28 (CONTINUED)

UNIVERSITY HYGIENIC LABORATORY
IOWA CITY, IOWA
RADIOLOGICAL ANALYSIS
SDWA SAMPLES

Data for May 1981

TOWN	COUNTY	IDENTIFICATION	RADIATION #	DATE SAMPLED	pCi/l			
					ALPHA	BETA	^{226}Ra	^{228}Ra
Alta Vista	Chickasaw	Well #1903000, 150'	R16411	06-10-80 09-29-80 02-04-81 05-04-81	<0.3	<0.6		
Buffalo Center	Winnebago	Well 500'	R16413	06-23-80 10-07-80 01-08-81 05-07-81	0.3	<0.6		
Macedonia	Pottawattamie		R16433	06-16-80 10-20-80 01-19-81 04-13-81	1.3	10		
New Market	Taylor		R16434	06-16-80 10-20-80 01-19-81 04-13-81	0.7	<0.4		
Kirkman	Shelby	Well #1, 54'	R16436	06-03-80 09-09-80 12-15-80 03-16-81	6.4	7	0.3	<0.6
Whittemore	Kossuth	Well #3, 180'	R16529	06-11-80 09-15-80 01-05-81 04-21-81	0.6	7		

TABLE 28 (CONTINUED)

UNIVERSITY HYGIENIC LABORATORY
IOWA CITY, IOWA
RADIOLOGICAL ANALYSIS
SDWA SAMPLES

Data for May 1981

TOWN	COUNTY	IDENTIFICATION	RADIATION #	DATE SAMPLED	pCi/l			
					ALPHA	BETA	^{226}Ra	^{228}Ra
Maxwell	Story	Well #All 3, 96'	R16531	06-16-80 09-23-80 01-19-81 04-28-81	0.4	6		
Roland	Story	Well #South	R16580	06-24-80 09-30-80 01-22-81 04-24-81	1.7	13		
Grand Mound	Clinton	Well #1, 253'	R16668	07-16-80 10-15-80 01-21-81 04-16-81	0.4	3		
New Liberty	Scott	Well #1, 210'	R16671	07-15-80 10-29-80 01-27-81 05-13-81	0.8	2		
Thurman	Fremont	Well 100'	R16672	07-15-80 11-03-80 02-09-81 05-19-81	1.8	6		
Bode	Humboldt	Well #2, 259'	R16704	07-22-80 10-21-80 02-02-81 05-04-81	<0.3	5		

TABLE 28 (CONTINUED)

UNIVERSITY HYGIENIC LABORATORY
IOWA CITY, IOWA
RADIOLOGICAL ANALYSIS
SDWA SAMPLES

Data for May 1981

TOWN	COUNTY	IDENTIFICATION	RADIATION #	DATE SAMPLED	pCi/l			
					ALPHA	BETA	^{226}Ra	^{228}Ra
Westfield	Plymouth	Well #1, 41'	R16705	07-21-80 10-20-80 01-26-81 04-28-81	<0.3	16		
Ossian	Winneshiek	Well #1, 987'	R16707	07-28-80 10-28-80 01-27-81 04-20-81	0.7	6		
Crescent	Pottawattamie	Well #1, 148'	R16723	07-27-80 10-27-80 02-02-81 05-01-81	0.9	48		
Hospers	Sioux	Well #F1, 2, 3, 20' Ronald Still, Rural Water System #1, R.R. #1, Hospers, IA 51238	R17591	02-02-81	7.3	1	<0.2	1.3
Luther	Boone	Well 610'	R17685	02-17-81	2.1	7	0.5	1.8

TABLE 28 (CONTINUED)

UNIVERSITY HYGIENIC LABORATORY
IOWA CITY, IOWA
RADIOLOGICAL ANALYSIS
DEQ MINERAL SAMPLES

Data for May 1981

TOWN	COUNTY	IDENTIFICATION	MINERAL #	DATE SAMPLED	pCi/l ALPHA	pCi/l BETA
Gilbert	Story	Well #3, 160'	16910	02-25-81	1.5	12
Defiance	Shelby	Well #64-2, 50'	16915	02-26-81	2.1	12
Deep River	Poweshiek	Well #1, 55'	16921	03-04-81	0.9	8
Geneva	Franklin	Well #1	16922	03-04-81	0.9	2
Wapello	Louisa	Well #2, 77'	16925	03-05-81	0.4	2
Perry	Dallas	Well #19	16927	03-05-81	2.1	15
Perry	Dallas	Well #18	16928		2.7	9
Perry	Dallas	Well #11, 123'	16929		1.4	7
Springville	Linn	Well #1, 475'	16934	03-10-81	0.3	2
Tipton	Cedar	Well #6, 455'	16948	03-12-81	0.8	<0.5
Mt. Vernon	Linn	Well #3, 405'	16961	03-18-81	1.5	5
Mt. Vernon	Linn	Well #2, 410'	16962	03-18-81	0.6	6
Harlan	Shelby	Well #20	16968	03-19-81	0.9	7
Rudd	Floyd	Well #1, 200'	16972	03-23-81	1.8	4
Rudd	Floyd	Well #2, 1228'	16973	03-23-81	2.3	13
Harlan	Shelby	Well #27	16974	03-19-81	1.0	7

TABLE 28 (CONTINUED)

UNIVERSITY HYGIENIC LABORATORY
IOWA CITY, IOWA
RADIOLOGICAL ANALYSIS
DEQ MINERAL SAMPLES

Data for May 1981

TOWN	COUNTY	IDENTIFICATION	MINERAL #	DATE SAMPLED	pCi/l	
					ALPHA	BETA
Hansell	Franklin	Well #1, 470'	16979	03-24-81	1.6	17
Marble Rock	Floyd	Well #1, 202'	16991	03-26-81	2.1	4
West Liberty	Johnson	Water Quality Management, 910 23rd Ave., Coralville	16995	03-30-81	1.3	4
Kelley	Story	Raw Water	16996	03-31-81	0.4	12
Glenwood	Mills	Well #2, 100'	16997	03-31-81	0.6	7
Glenwood	Mills	Well #3, 100'	16998	03-31-81	0.7	10
Emerson	Mills	Well #3, 100'	17005	04-02-81	1.6	3
Emerson	Mills	Well #2, 117'	17006	04-02-81	2.0	5
W. Central RWA	Carroll	Well #BR-7, 55'	17026	04-13-81	0.7	3
	Louisa	Well #103, 173', Layne Western Co., Inc., 705 S. Duff, Ames	17029	04-14-81	0.5	<0.5
W. Central RWA	Carroll	Well #3, 55'	17033	04-15-81	1.0	<0.5
West Union	Fayette	Well #West, 55'	17038	04-15-81	0.9	<0.5
West Union	Fayette	Well #East, 55'	17039	04-15-81	0.5	4
Slater	Story	Well #2	17040	04-20-81	0.6	17
Janesville	Bremer	Well #2, 120'	17041		0.8	<0.5

TABLE 29

UNIVERSITY HYGIENIC LABORATORY
IOWA CITY, IOWA
RADIOLOGICAL ANALYSIS
SDWA SAMPLES

Data for June 1981

TOWN	COUNTY	IDENTIFICATION	RADIATION # OR MINERAL #	DATE SAMPLED	pCi/l ALPHA	BETA	^{226}Ra	^{228}Ra
Corning	Adams		14162A	05-27-80 09-10-80 01-13-81 05-20-81	0.8	10		
Rock Rapids	Lyon	Well #B-4, 40', Jerry Cook, Lyon-Sioux Rural Water Assoc., Box 309, Rock Rapids, IA 51246	15186A	06-12-79 04-01-80 09-29-80	3.0	2	0.2	1.8
Westgate	Fayette	Well #1, 98'	15224A	09-09-80 12-08-80 03-10-81 06-08-81	0.4	Nil		
Belmond	Wright	Well #1, 520'	15318A	09-10-80 12-05-80 03-11-81 06-09-81	0.2	8		
Traer	Tama	Well #3, 1813'	15411A	09-08-80 12-04-80 03-09-81 06-08-81	1.0	18		
Ames	Story	Well 180', Bob Crane, Hillsdale Mobile Home Park, R.R. #4, Ames, IA 50010	15503A	08-14-79 03-04-80 06-02-80 10-15-80 12-11-80	3.9	5	1.3	1.1
What Cheer	Keokuk	Well 1928'	15577A	12-30-80	26	31	11.3	2.5

TABLE 29 (CONTINUED)

UNIVERSITY HYGIENIC LABORATORY
IOWA CITY, IOWA
RADIOLOGICAL ANALYSIS
SDWA SAMPLES

Data for June 1981

TOWN	COUNTY	IDENTIFICATION	RADIATION # OR MINERAL #	DATE SAMPLED	pCi/l			
					ALPHA	BETA	^{226}Ra	^{228}Ra
Hartley	O'Brien		15661A	11-27-79 03-04-80 06-12-80 10-13-80	5.5	21	0.1	<0.6
Brunsville	Plymouth	Well #1, 30'	15843A	02-05-80 04-22-80 08-13-80 11-18-80	3.6	13	0.2	<0.6
Wesley	Kossuth	Well #2, 302'	15851A	02-11-80 08-12-80 11-12-80	5.9	3	2.0	0.6
Cumberland	Cass		15854A	02-12-80 05-13-80 08-11-80 11-17-80	2.6	6	0.3	1.7
West Des Moines	Polk	Well #1&2, 2460'	15874A	02-19-80 06-23-80 08-13-80 11-19-80	6.0	11	1.5	<0.6
Ayrshire	Palo Alto	Well #2, 519'	R16670	07-28-80 12-02-80 03-09-81 06-11-81	1.7	11		

TABLE 29 (CONTINUED)

UNIVERSITY HYGIENIC LABORATORY
IOWA CITY, IOWA
RADIOLOGICAL ANALYSIS
SDWA SAMPLES

Data for June 1981

TOWN	COUNTY	IDENTIFICATION	RADIATION # OR MINERAL #	DATE SAMPLED	pCi/l			
					ALPHA	BETA	^{226}Ra	^{228}Ra
Plover	Pocahontas	Well #1, 45'	R16673	07-30-80 11-11-80 02-17-81 05-27-81	0.7	8		
Oakland Acres	Jasper	Well Pond, Clifford A. Thompson, City of Oakland Acres, R.R. #2, Grinnell, IA 50112	R16724	07-29-80 10-25-80 02-17-81 05-20-81	<0.1	2		

TABLE 30

UNIVERSITY HYGIENIC LABORATORY
IOWA CITY, IOWA
RADIOLOGICAL ANALYSIS
SDWA QUARTERLY RECHECKS

Data for April 1981

TOWN	COUNTY	IDENTIFICATION	RADIATION #	DATE SAMPLED	pCi/l			
					ALPHA	BETA	^{226}Ra	^{228}Ra
Lockridge	Jefferson	Well #2, 1100'	R17556	01-19-81	23	33	7.6	2.4
Ankeny	Dallas	Well #1, 510'; #2, 4600' Tom C. Thorpe, P.O. Box 98, Fox Creek Acres Water System, Ankeny, IA	R17819	03-24-81	31	<0.5	1.4	<0.6
Danville	Des Moines	Well #I, 1180'	R17821	03-10-81	21	39	9.5	3.7
Leon	Decatur	Well #4, 2815'	R17822	03-16-81	6.7	36	6.1	5.0
Hardy	Humboldt	Well 90'	R17833	04-01-81			5.6	2.3
West Bend	Palo Alto	Well #4, 1360'	R17835	04-13-81	10	39	5.8	1.7
Hartford	Warren	Well #4, 2120'	R17836	04-06-81			2.4	0.7
Toledo	Tama	Well #8, 2000'	R17995	04-13-81			<0.2	1.3
Mason City	Cerro Gordo		R17996	04-13-81			<0.2	0.8
LaPorte City	Black Hawk	Well #3, 250'; #4, 1410'	R17997	04-15-81			2.4	2.3
Maurice	Sioux	Well #1, 520'	R17998	04-13-81			3.1	3.4
Washington	Washington		R17999	04-13-81			4.7	2.2

TABLE 30 (CONTINUED)

UNIVERSITY HYGIENIC LABORATORY
IOWA CITY, IOWA
RADIOLOGICAL ANALYSIS
QUARTERLY RECHECK SAMPLES

Data for May 1981

					pCi/l.			
TOWN	COUNTY	IDENTIFICATION	RADIATION #	DATE SAMPLED	ALPHA	BETA	^{226}Ra	^{228}Ra
Remsen	Plymouth	Well 35'	R17834	04-14-81			0.2	1.0
West Bend	Palo Alto	Well #4, 1360'	R17835	04-13-81	10	39	5.8	1.7
West Point	Lee	Well #3, 1900'	R18128	05-13-81			8.0	1.1
Nevada	Story	Well #3, 3340'; #4, 2630'	R18131	05-12-81			7.0	3.8
Earlham	Madison	Well #3, 2900'	R18132	05-11-81			7.6	3.2
Bayard	Guthrie	Well #I, 209'	R18133	05-11-81			2.8	2.2
Anamosa	Jones	Well #4, 450'	R18136	05-13-81			0.6	<0.6

TABLE 30 (CONTINUED)

UNIVERSITY HYGIENIC LABORATORY
IOWA CITY, IOWA
RADIOLOGICAL ANALYSIS
QUARTERLY RECHECK SAMPLES

Data for June 1981

TOWN	COUNTY	IDENTIFICATION	RADIATION #	DATE SAMPLED	pCi/l			
					ALPHA	BETA	^{226}Ra	^{228}Ra
Lockridge	Jefferson	Well #2, 1100'	R18000	05-12-81	53	64	8.9	2.2
Atkins	Benton	Well #1, 456'; #2, 485'	R18129	05-27-81			3.0	2.1
Grand Junction	Greene	Well #1, 317'	R18130	05-18-81			1.4	2.4
Marcus	Cherokee	Well #1, 1301'; #2, 880'	R18134	05-07-81	13	28	4.8	3.2
Stuart	Guthrie	Well #3, 2800'	R18135	05-20-81	13	42	7.9	3.1
Salem	Henry	Well #4, 1825'	R18137	05-11-81	16	27	4.9	1.1
St. Paul	Lee	Well #1	R18138	05-20-81	16.1	33	3.4	1.2
State Center	Marshall	Well #5, 2950'	R18238	06-08-81			5.7	2.9
Olds	Henry	Well #1, 250'; #2, 275'; #3, 1905'	R18239	06-08-81			5.9	1.1
Grimes	Polk	Well #1, 2600'	R18240	06-10-81			4.0	1.8
Danville	Des Moines	Well #1, 1840'	R18243	06-04-81	13.9	32	10.1	2.1
Maquoketa	Jackson		R18244	06-12-81			0.2	0.9
Murray	Clarke		R18247	06-10-81			6.0	2.1
New Albin	Allamakee	Well #1, 570'	R18251	06-08-81			2.4	1.7
Wellman	Washington	Well #Jordan, 1700'	R18253	06-09-81			9.8	1.9
Hartford	Warren	Well #4, 2120'	R18256	06-10-81			2.5	<0.6

TABLE 31

UNIVERSITY HYGIENIC LABORATORY
STATEWIDE DYNAMIC SURFACE WATER REPORT
Background Radiation Levels, Tritium

Data for 2nd Quarter 1981

River	City	Dates Collected Composite Samples	Date Counted	^{3}H Activity nCi/l
Cedar	Cedar Rapids	4-8, 14, 21, 28-81	07-16-81	<1.18
	Cedar Rapids	5-5, 12, 19, 26-81	07-16-81	<1.18
	Cedar Rapids	6-2, 9, 16, 23, 30-81	07-16-81	<1.18
Cedar	Vinton	4-6, 13, 20, 27-81	07-16-81	<1.18
	Vinton	5-4, 26-81	07-16-81	<1.18
	Vinton	6-1, 8, 15, 22, 29-81	07-16-81	<1.18
Des Moines	Des Moines	5-6-81	07-16-81	<1.18
Iowa	Iowa City	4-2-81	07-16-81	<1.18
	Iowa City	5-6-81	07-16-81	<1.18
	Iowa City	6-1-81	07-16-81	<1.18
Mississippi	Davenport	4-10, 15, 22, 30-81	07-16-81	<1.18
	Davenport	5-7, 12, 21, 28-81	07-16-81	<1.18
	Davenport	6-4, 10, 17, 24-81	07-16-81	<1.18
Mississippi	Dubuque	4-3, 9, 16, 23, 30-81	07-16-81	<1.18
	Dubuque	5-7, 12, 21, 28-81	07-16-81	<1.18
	Dubuque	6-4, 18, 26-81	07-16-81	<1.18
Mississippi	Lansing	4-6, 13, 20, 27-81	07-16-81	<1.18
	Lansing	5-4, 11, 18-81	07-16-81	<1.18
	Lansing	6-1, 9, 16, 22, 29-81	07-16-81	<1.18
Missouri	Council Bluffs	4-6, 13, 20, 27-81	07-16-81	<1.18
	Council Bluffs	5-5, 11, 18, 27-81	07-16-81	<1.18
	Council Bluffs	6-1, 8, 15, 22, 29-81	07-16-81	<1.18
Missouri	Sioux City	4-6, 13, 20, 28-81	07-16-81	<1.18
	Sioux City	5-4, 11, 18, 26-81	07-16-81	<1.18
	Sioux City	6-1, 8, 30-81	07-16-81	<1.18
Nishnabotna	Hamburg	4-6-81	07-16-81	<1.18
	Hamburg	5-26-81	07-16-81	<1.18
	Hamburg	6-22-81	07-16-81	<1.18
Skunk	Ames	4-9, 16, 30-81	07-16-81	<1.18
	Ames	5-14, 21-81	07-16-81	<1.18
	Ames	6-18, 25-81	07-16-81	<1.18

TABLE 32

UNIVERSITY HYGIENIC LABORATORY
IOWA CITY, IOWA
RADIOLOGICAL ANALYSIS
DEQ MINERAL SAMPLES
Data for April 1981

TOWN	COUNTY	IDENTIFICATION	MINERAL #	DATE SAMPLED	pCi/l			
					ALPHA	BETA	^{226}Ra	^{228}Ra
Worthington	Dubuque	Well #1, Winslow Drilling Co P.O. Box 162, R.R. #1, Walcott, IA 52773	16561		13	5	2.7	1.8
Iowa City	Johnson	Well #D-40, 400', IGS-USGS Box 1230, Iowa City 52244	16581	10-02-80	11	16	3.8	1.7
Iowa City	Johnson	Well #D-48E, 225', Darwin Evans, USGS, Box 1230 Iowa City, IA	16592	10-14-80	15	23	5.3	1.6
Cedar Rapids	Linn	Well #10 West, Thomas C. Noth 751 J Ave., N.E. Cedar Rapids	16596	10-15-80	2.2	Nil	<0.2	<0.5
Lockridge	Jefferson	Well #2, 1050'	16634	11-05-80	20	13	10.8	2.3
Danville	Des Moines	Bailey Pump & Well Drilling	16668	11-14-80	15	6	6.3	6.0
Adel	Dallas	Thorpe Well Co., P.O. Box 157 Ankeny, IA 50021	16703	12-01-80	6.0	15	2.3	1.5
Ponca, Neb.	Dixon	Test Well, Buell Winter Mousel, 666 Benson Bldg. Sioux City, IA 51101	16725	12-18-80	3.2	9	<0.2	1.0
Perry	Dallas	Well #1, Howard R. Green Co. Consulting Eng., P.O. Box 9009, Cedar Rapids, IA 52409	16744	12-17-80	2.0	10	1.6	<0.6

TABLE 32 (CONTINUED)

UNIVERSITY HYGIENIC LABORATORY
IOWA CITY, IOWA
RADIOLOGICAL ANALYSIS
DEQ MINERAL SAMPLES

Data for April 1981

TOWN	COUNTY	IDENTIFICATION	MINERAL #	DATE SAMPLED	pCi/l			
					ALPHA	BETA	^{226}Ra	^{228}Ra
Nora Springs	Floyd	Well 200', Calvin Diegel 27 N. Iowa, Nora Springs 50458	16778	01-19-81	3.9	3	0.3	<0.6
Conroy	Iowa	Well #2, 650', Layne Western Co., 705 S. Duff St., Ames, 50010	16783	01-20-81	7.8	7	2.6	1.4
New Sharon	Mahaska	Well #1, 60', Junior Fisher, New Sharon, IA	16823	01-26-81	3.7	< 0.4	0.4	<0.5

TABLE 33

UNIVERSITY HYGIENIC LABORATORY
IOWA CITY, IOWA
RADIOLOGICAL ANALYSIS
DEQ MINERAL SAMPLES

Data for May 1981

TOWN	COUNTY	IDENTIFICATION	MINERAL #	DATE SAMPLED	pCi/l	
					ALPHA	BETA
Shelby Co. Rural Water	Shelby	Well #All wells, 28'	17050	04-21-81	0.3	<0.5
Arlington	Fayette	Well #3, 1312'	17054	04-22-81	1.6	<0.6
Arlington	Fayette	Well #4, 1360'	17055	04-22-81	1.7	16
Vail	Crawford	Well #1, 32'	17058	04-23-81	0.4	<0.5

TABLE 34

UNIVERSITY HYGIENIC LABORATORY
IOWA CITY, IOWA
RADIOLOGICAL ANALYSIS
DEQ MINERAL SAMPLES

Data for June 1981

TOWN	COUNTY	IDENTIFICATION	MINERAL #	DATE SAMPLED	pCi/l			
					ALPHA	BETA	^{226}Ra	^{228}Ra
Arcadia	Carroll		15898	02-26-80	^{90}Sr = <0.5			
Adair	Adair	Well #68-1, 2700'	16198	05-13-80	^{90}Sr = <0.5			
Dubuque	Dubuque	Well #7, 1500'	16880	02-09-81	3.7	7	2.9	
Perry	Dallas	Well #12, 122'	16926	03-05-81	3.0	22	2.5	
Harlan	Shelby	Well #19	16969		8.3	16	0.7	
Harlan	Shelby	Well #16	16970		7.4	26	0.4	
Burt	Kossuth	Well #3, 600'	16971	03-18-81	3.1	17	2.5	
Fairfax	Linn	Well #1, 410'	16999	03-30-81	3.2	9	2.1	
Colfax	Jasper	Duane Skidmore, 11 N. Walnut. Colfax, IA 50054	17004		11	18	2.8	<0.6
Postville	Allamakee	Well #1, 993'	17061	04-27-81	0.3	4		
Waukon	Allamakee	Well #2, 680'	17076	04-29-81	0.2	4		
Waukon	Allamakee	Well #3, 890'	17077	04-29-81	0.7	3		
Ill.-Ia. Gas & Elec.	Louisa	Well #104, 175', Layne Western Co., 705 S. Duff Ames, IA	17082	05-01-81	0.1	<0.5		
Manly	Worth	Well #1, 149'	17085	05-04-81	0.8	<0.5		
Manly	Worth	Well #2, 435'	17086	05-04-81	0.8	3		

TABLE 34 (CONTINUED)

UNIVERSITY HYGIENIC LABORATORY
IOWA CITY, IOWA
RADIOLOGICAL ANALYSIS
DEQ MINERAL SAMPLES

Data for June 1981

TOWN	COUNTY	IDENTIFICATION	MINERAL #	DATE SAMPLED	pCi/l			
					ALPHA	BETA	^{226}Ra	^{228}Ra
Manly	Worth	Well #3, 320'	17087	05-04-81	0.5	3		
Dysart	Tama	Well #2	17097	05-06-81	2.4	19		
Calmar	Winnishiek	Well #2, 700'	17098	05-06-81	0.3	7		
Calmar	Winneshiek	Well #3, 700'	17099	05-06-81	0.4	2		
Iowa City	Johnson	Well #WC-5, 315', IGS & USGS, Iowa City, IA 52240	17100	05-05-81	1.8	11		
Ill.-Ia. Gas & Elec.	Louisa	Well #102, 164', Kilcayne Louisa Gen Station, Muscatine, IA	17104	05-08-81	0.1	4		
Chelsea	Tama	Well #1, 36'	17105	05-11-81	1.4	Nil		
Grimes	Polk	Well #2	17108	05-12-81	1.0	Nil		
Michellville	Polk	Well #2	17114	05-15-81	0.8	1		
Waucoma	Fayette	Well #1, 670'	17122	05-18-81	1.8	16		
Pella	Marion	Well #Ranney, 41'	17127	05-21-81	1.3	8		
Monona	Clayton	Well #1, 840'	17128	05-21-81	1.4	7		
Monona	Clayton	Well #2, 840'	17129		1.9	2		
Monona	Clayton	Well #3, 850'	17130	05-21-81	2.1	1		
Martelle	Jones	Well #1, 121'	17132	05-26-81	<0.1	4		

TABLE 34 (CONTINUED)

UNIVERSITY HYGIENIC LABORATORY
IOWA CITY, IOWA
RADIOLOGICAL ANALYSIS
DEQ MINERAL SAMPLES

Data for June 1981

TOWN	COUNTY	IDENTIFICATION	MINERAL #	DATE SAMPLED	pCi/l			
					ALPHA	BETA	^{226}Ra	^{228}Ra
Martelle	Jones	Well #2, 249'	17133	05-26-81	0.5	3		
Marshalltown	Marshall	Well 70-168	17137	05-28-81	1.6	4		
Ill.-Ia. Gas & Elec.	Louisa	Well #101, 155', Layne Western, 705 S. Duff, Ames, IA	17138	05-27-81	Nil	Nil		
Iowa City	Johnson	Well #WC-7, 561', IGS & USGS, Darwin Evans	17139	05-29-81	2.6	25		
Searsboro	Poweshiek	Well #1, 150'	17140	06-01-81	1.9	7		
Harvey	Marion	Well #1, 88'	17143	06-02-81	0.6	4		
LeGrand	Marshall	Well #2, 95'	17153	06-03-81	<0.1	3		

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TABLE 35

UNIVERSITY HYGIENIC LABORATORY
IOWA CITY, IOWA
RADIOLOGICAL ANALYSIS
CONCENTRATIONS OF ^{90}Sr IN IOWA MILK SAMPLES

Data for 2nd Quarter, 1981

TOWN	DATE OF SAMPLE	RADIATION NO.	^{90}Sr, pCi/l
Iowa City	04-14-81	R18056	3.8
LeMars	04-24-81	R18112	2.1
Iowa City	05-26-81	R18227	2.8
Iowa City	06-09-81	R18278	3.0
Iowa City	06-23-81	R18337	3.0
LeMars	06-01-81	R18263	2.0
LeMars	06-26-81	R18347	2.4